

This is a RED Stamp

**ROCKY FLATS ENVIRONMENTAL
TECHNOLOGY SITE**

**EMD OPERATING
PROCEDURES MANUAL
VOL I: FIELD OPERATIONS**

**Manual No.: 5-21000-OPS-FO
New Manual No.: 4-11000-ER-OPS-FO
Procedure No.. Table of Contents, Rev 74
Page: 1 of 3
Effective Date. 10/07/94
Organization: Environmental Management**

THIS IS ONE VOLUME OF A SIX VOLUME SET WHICH INCLUDES:

**VOLUME I: FIELD OPERATIONS (FO)
VOLUME II: GROUNDWATER (GW)
VOLUME III GEOTECHNICAL (GT)
VOLUME IV. SURFACE WATER (SW)
VOLUME V: ECOLOGY (EE)
VOLUME VI: AIR (AP)**

TABLE OF CONTENTS FOR VOLUME I. FIELD OPERATIONS

Procedure No.	Title	Rev. No.	Effective Date
FO 01	Air Monitoring and Dust Control	2	05/12/92
FO 03	General Equipment Decontamination	2	05/12/92
94-DMR-001021	Section FO 03 Text Addition	2	05/26/94
94-DMR-001010	LIMITED SCOPE Section FO 03 Text Modification	2	06/01/94
94-DMR-001224	Equipment Decontamination Location Adjustment	2	07/15/94
FO 04	Heavy Equipment Decontamination	2	05/12/92
94-DMR-001009	LIMITED SCOPE Section FO 04 Text Modification	2	06/01/94
FO 05	Handling of Purge and Development Water	2	05/12/92
94-DMR-000278	Groundwater Monitoring Modifications	2	02/25/94
FO 06	Handling of Personal Protective Equipment	2	05/12/92
FO 07	Handling of Decontamination Water and Wash Water	2	05/12/92
94-DMR-001175	LIMITED SCOPE - Decontamination Water Disposal Location Changes	2	06/20/94
FO 08	Handling of Drilling Fluids and Cuttings	2	05/12/92
94-DMR-001650	Procedural Clarifications	2	09/27/94

ADM.

.D

**DOCUMENT CLASSIFICATION REVIEW WAIVER
PER R.B. HOFFMAN, CLASSIFICATION OFFICE
JUNE 11 1991**

**ROCKY FLATS ENVIRONMENTAL
TECHNOLOGY SITE****EMD OPERATING
PROCEDURES MANUAL
VOL I- FIELD OPERATIONS****Manual No.:
New Manual No :
Procedure No.:
Page:
Effective Date
Organization:****5-21000-OPS-FO
4-11000-ER-OPS-FO
Table of Contents, Rev 74
2 of 3
10/07/94
Environmental Management**

Procedure No.	Title	Rev. No.	Effective Date
FO 09	Handling of Residual Samples	2	05/12/92
FO 10	Receiving, Labeling, and Handling Environmental Materials Containers	2	05/12/92
93-DMR-000677	DMR	2	11/01/93
94-DMR-000244	Drying Agent Modification	2	03/14/94
94-DMR-000558	Form Modification	2	04/15/94
94-DMR-001649	Deletion of Text Addressed in FO 08	2	09/27/94
FO 11	Field Communications	2	05/12/92
FO 12	Decontamination Facility Operations	2	05/12/92
FO 13	Containerization, Preserving, Handling and Shipping of Soil and Water Samples	2	05/12/92
93-DMR-000530	Section FO 13 Modification	2	11/04/93
93-DMR-000667	Section FO 13 Modification	2	11/20/93
94-DMR-000143	Composite Sampling Clarification	2	02/11/94
94-DMR-001670	New Statement of Work	2	09/15/94
FO 14	4-B29-ER-OPS-FO 14 Field Data Management	3	09/09/94
FO 15	Photoionization Detectors (PIDs) and Flame Ionization Detectors (FIDs)	2	05/12/92
FO 16	Field Radiological Measurements	2	05/12/92
FO 18	Environmental Sample Radioactivity Content Screening	1	05/12/92
FO 19	Base Laboratory Work	2	05/12/92

**ROCKY FLATS ENVIRONMENTAL
TECHNOLOGY SITE**

**EMD OPERATING
PROCEDURES MANUAL
VOL I FIELD OPERATIONS**

Manual No.·
New Manual No.
Procedure No.·
Page:
Effective Date:
Organization:

5-21000-OPS-FO
4-11000-ER-OPS-FO
Table of Contents, Rev 74
3 of 3
10/07/94
Environmental Management

Procedure No.	Title	Rev. No.	Effective Date
FO 23	4-F99-OPS-FO 23 Management of Soil and Sediment Investigative Derived Materials (IDM)	0	01/11/94
94-DMR-000137	Training Requirements Clarification	0	01/28/94
94-DMR-000148	Section FO 23 Modifications	0	02/09/94
94-DMR-001108	Buried Instrumentation and Existing Soil	0	06/14/94
94-DMR-001350	Various Text Additions and Deletions Regarding Drums and Use of SOP FO 29	0	08/16/94
FO 25	4-B11-ER-OPS-FO 25 Shipment of Radioactive Materials Samples	0	12/01/93
FO 27	4-BO1-ER-OPS-FO 27 Collection of Floor/Equipment Hot Water Rinsate Samples	0	07/26/93
FO 29	4-H46-ENV-OPS-FO 29 Disposition of Soil and Sediment Investigation-Derived Materials	0	06/24/94
94-DMR-001226	Allowance of Procedural Use for Waste Piles	0	07/15/94
•94-DMR-001741	Permission of Use of Computer-Generated Forms and Other Minor Corrections	0	10/07/94
•FO 30	4-I11-ER-OPS-FO 30 Environmental Restoration Program Division Equipment Operation	0	10/07/94
FO 32	4-I50-ENV-OPS-FO 32 Treated Effluent Discharge Operable Unit 1, Building 891	0	04/13/94

DOCUMENT MODIFICATION REQUEST (DMR)

PAGE 1 of 6

INFORMATION ONLY

Refer to 1081-203-001 for Processing Instructions
 CONTROLLED DOCUMENT
 EG&G - ROCKY FLATS PLANT
 ENVIRONMENTAL MANAGEMENT
 RCRA EIS - Appendix 29 Rev 0
 This is a RED Stamp

1 Date

8/9/94

25

DMR No

94-DMR-001741

3 New Document Number or Document Number if it is to be changed with this Revision

NA

5 Document Title

Disposition of Soil and Sediment Investigation-Derived Materials

6 Document Type

☒ Procedure☐ Other

7 Document Modification Type (Check only one)

☐ New☐ Revision☐ Intent Change☒ Nonintent Change☐ Editorial Correction☐ Cancellation

8 Item

9 Page

10 Step

11 Proposed Modifications

- | | | | |
|---|---|-------|---|
| 1 | 4 | TOC | Section 7 10 Delete "(Form FO 29B)" |
| 2 | 4 | TOC | Section 7 11 Delete "(Form FO 29C)" |
| 3 | 4 | TOC | Appendix 2 Delete "Form FO29A, ADM RCRA Constituents of Concern and" |
| 4 | 4 | TOC | Appendices 4 and 5 Delete these appendices' entries |
| 5 | 4 | TOC | Appendix 6 Renumber this to Appendix 4 |
| 6 | 4 | TOC | Appendix 7 Renumber this to Appendix 5 |
| 7 | 4 | TOC | Appendix 8 Renumber this to Appendix 6 |
| 8 | 5 | Sec 1 | 1 First sentence Change "an interim procedure for classifying the backlog of soil" to "a procedure for classifying the soil"
2 Delete the last two sentences of this section "IDM generated in the future currently existing plant procedures and SW-846 " |

12 Justification (Reason for Modification EJO # TP # etc)

Major reason for modification is to permit use of computer-generated forms instead of manual forms, saving time and effort
 In addition, minor errors were corrected, some sentences rewritten for clarity, etc

If modification is for a new procedure or a revision list concurring disciplines in Block 13 and enter N/A in Blocks 14 and 15 If modification is for any type of change or a cancellation organizations are listed in Block 13 then Concuror prints and signs in Block 14 and dates in Block 15

13 Organization	14 Print Sign (if applicable)	15 Date (if applicable)
Group 1 OU Closure	A L Primrose A L Primrose	9/21/94
OU 2 Closure	W. S. Keith	9/21/94
SPP OU 4 Closure	S. R. Keith	9/21/94
IA OU/D&D Closure	GREGG A ANDERSON	9/22/94
DM&RS	K. BENTZEN	9/22/94
OU 5,6,7	E. C. Mast	9/21/94
OS	L. L. LUKER	9/22/94
PA		

16 Originator's Supervisor (print sign/date)

R Zeke Houk

17 Assigned SME/Phone/Pager/Location

Steven Needler/6961/7579/080

18 Cost Center

0249

19 Charge Number

989427

20 Requested Completion Date

8/31/94

21 Effective Date

10/7/94

22 Accelerated Review?

Yes ☒ No ☐

23 ORC Review

NOT NEU START

24 Responsible Manager (print sign/date)

Laure Gregory-Frost

DOCUMENT CLASSIFICATION REVIEW WAIVER
 PER R.B. HOFFMAN, CLASSIFICATION OFFICE

REVIEWED FOR CLASSIFICATION / UCNI

BY

DATE

DMR (continuation sheet)

Page 2 of 6

9/16/94 *lme*

Refer to 1-A01-PPG-001 for Processing Instructions

Print or Type All Information (Except Signatures)

25 DMR No 94-DMR-001741

2 or 3 Document Number/Revision

4-H46-ENV-OPS-FO 29/Rev 0

5 Document Title

Disposition of Soil and Sediment Investigative-Derived Materials

8 Item	9 Page	10 Step	11 Proposed Modifications
9	5	Sec 2	Bulleted list, 2nd bullet Delete ", Form FO29A, IDM Resource Conservation and Recovery Act (RCRA) Constituent of Concern" and "(Form FO 29A) and"
10	5	Sec 2	Bulleted list, 7th bullet Change "metals comparison" to "background comparison of metals"
11	5	Sec 2	Bulleted list, 10th bullet Delete "[in accordance with Appendix 4, Form FO29B, RCRA Risk Analysis (Form FO29B)]"
12	5	Sec 2	Bulleted list, 11th bullet Delete "[in accordance with Appendix 5, Form FO29C, Inclusive Risk Analysis (Form FO29C)]"
13	6	Sec 3	Fourth sentence Change "Form FO 29A (Appendix 2)" to "Form FO29E (Appendix 5)"
14	6	Sec 3	Case No 3, first sentence Change "Soil and sediment that contain IDM RCRA Constituents of Concern and IDM Constituents of Concern" to "Soil and sediment that do not exhibit the characteristics of corrosivity, reactivity, or ignitability, do not exceed adjusted TCLP regulatory levels, or the RCRA risk analysis criteria, but do contain IDM Constituents of Concern"
15	10	Sec 4	Toxicity Characteristic Leaching Procedure (TCLP) At the end of this paragraph, add the sentence "In this procedure, the TCLP process is simulated by multiplying the TCLP values by an Approximation Factor (AF) of 20 "
16	10	Sec 4	Reported Detection Limits (DLs) Change "the RFEDS" to "the RFEDS database"
17	12	Sec 6	Change "EE&T" to "PM"
18	13	7 1[3]	Delete both Note 1 and Note 2
19	13	7 1[4]	Delete this entire entry, from " ERPD EE&T" through "drums containing IDM "
20	14	7 2[1]	Change "FO 29A" to "FO 29E"
21	14	7 2[2]	Change "FO 29A" to "FO 29E"

12 Justification (Reason for Modification)

DMR (continuation sheet)

9/16/94 Page 3 of 6

Refer to 1-A01-PPG-001 for Processing Instructions

Printer Type All Information (Except Signatures)

25 DMR No 94-DMR-001741

2 or 3 Document Number/Revision 4-H46-ENV-OPS-FO 29/Rev 0

5 Document Title
Disposition of Soil and Sediment Investigation-Derived Materials

8 Item	9 Page	10 Step	11 Proposed Modifications
22	15	7 3 [2]	Note 3 Change "either Form FO 29B, C, or E (whichever is appropriate)" to "Form FO 29E"
23	16	7 3[4]	Change "analytical methods" to "analytical suites"
24	17	7 3[9]	Change this entry from "Record on Form as appropriate " to "Determine whether data are adequate, based upon the information on Form FO 29D "
25	22	7 4[11] [A]	Change "FO 29A" to "FO 29E"
26	22	7 4[11] [B]	Change this entry to "[B] Calculate the average concentration for that constituent "
27	23	7 5	Delete this section
28	23	7 6[3]	Change "FO 29A, Column 3" to "FO 29E, Column 1"
29	24	7 7[2]	Delete this entry
30	24	7 7[3]	Change "record Yes on Form FO 29A, Column 5" to "enter the analyte name on FO 29E, Column 1"
31	24	7 7[4]	Change "record No on Form FO 29A, Column 5" to "do not record that metal in any FO 29E columns, including Column 1"
32	24	7 7[6] [A]	Change this entry "Check Form FO 29A" to "Record in FO 29E, Column 1 the following message 'All Analytes Non-Detect/Below Background'"
33	24	7 7[6] [B]	Change "Form FO 29A" to "Form FO 29E"
34	26	7 7[7]	Change "OR metals exceed" to "OR any metals exceed"
35	26	7 8[1]	1 Change "IF any metal or any organic constituent has a Yes recorded on Form FO 29A, Column 5," to "IF any analytes are recorded on Form FO 29E, Column 1," 2 Alter "TCLP Constituent of Concern Maximum Contaminant Levels", add " ELSE go to Section 7 12"
36	26	7 8[2]	Change "record the TCLP regulatory level on Form FO 29A, Column 6" to "multiply the TCLP regulatory level by the AF (20)"
37	26	7 8[3]	Delete this entry
38	26	7 8[4]	1 Change "TCLP level on Form FO 29A, Column 7 is less than the constituent concentration in Column 3" to "TCLP level is less than the constituent concentration in Form FO 29E, Column 2" 2 Change "record Yes in Column 8" to "record Yes in Column 4"
39	26	7 8[5]	1 Change "TCLP level on Form FO 29A, Column 7 is greater than the constituent concentration in Column 3" to "TCLP level is greater than the constituent concentration in Form FO 29E, Column 2" 2 Change "record No in Column 8" to "record No in Column 4"
40	26	7 8[6]	1 Change "FO 29A, Column 8" to "FO 29E, Column 4" 2 Change the entire entry "Check the TCLP Regulatory Form FO 29A" to "The IDM is considered RCRA waste Disposition as stated in Section 7 12[2]"
41	27	7 8[7]	1 Change "FO 29A, Column 8" to "FO 29E, Column 4" 2 Delete "[A] Check the TCLP Regulatory [C]"
42	27	7 9[1]	Change "FO 29A" to "FO 29E"
43	27	7 9[2]	1 Change "Form FO 29A, Column 1, is identified as a IDM" to "Form FO29E, Column 1, is identified as an IDM" 2 Change "FO 29A, Column 9" to "FO 29E, Column 5"
44	27	7 9[3]	Change "FO 29A" to "FO 29E"
45	27	7 9[4]	1 Change "Form FO 29A" to "Form FO 29E" 2 Change "FO 29A, Column 9" to "FO 29E, Column 5"

DMR (continuation sheet)

Page 4 of 6
9/16/94 *lme*Refer to 1-A01-PPG-001 for Processing Instructions
Printer Type All Information (Except Signatures)

25 DMR No 94-DMR-001741

2 or 3 Document Number/Revision			4-H46-ENV-OPS-FO 29/Rev 0	5 Document Title
			Disposition of Soil and Sediment Investigation-Derived Materials	
8 Item	9 Page	10 Step	11 Proposed Modifications	
46	28	7 9[5]	1 Change "FO 29A" to "FO 29E" 2 Change "Form FO 29A, Column 9" to "Form FO 29E, Column 5"	
47	28	7 9[6]	1 Delete entry [A] 2 Change "FO 29A" to "FO 29E" 3 Delete "(Form FO 29C)"	
48	28	7 9[7]	1 Delete entries [A] and [B] 2 Change "FO 29A" to "FO 29E" 3 Delete "(Form FO 29B)"	
49	29-32	7 10	Every time that this header appears, delete "(Form FO 29B) " This occurs on pages 29 through 32	
50	29	7 10	Note Change "FO 29B in accordance with Appendix 5, Form FO 29B, RCRA Risk Analysis" to "FO 29E"	
51	29	7 10[2] thru 7 10[3]	Delete these sections, including the Note	
52	29	7 10[4]	Delete the [A] and [B] subentries	
53	30	7/10[5]	Delete this section	
54	30	7 10[6]	1 Change "IF an organic compound or metal has values recorded on Form FO 29B, Columns 2 and 3" to "IF a RCRA constituent has a carcinogenic RBC" 2 Change "Column 3" to "the appropriate RBC" on entry [A] 3 Change "FO 29B" to "FO 29E" on entries [A] through [D] 4 Change "Column 4" to "Column 6" on entries [B] and [C]	
55	30	7 10[7]	1 Change "IF an organic compound or metal has a value recorded on Form FO 29B, Columns 2 and 5" to "IF a RCRA constituent has a noncarcinogenic RBC" 2 Change "Column 5" to "the appropriate RBC" on entry [A] 3 Change "FO 29B" to "FO 29E" on entries [A] through [D] 4 Change "Column 6" to "Column 7" on entries [B] and [C]	
56	31	7 10[8]	Change "Form FO 29B for both Columns 4 and 6" to "Form FO 29E for both Columns 6 and 7"	
57	31	7 10[8] [A]	Change this entry to "Forward Form FO 29E to the ERPD PM"	
58	31	7 10[8] [B] & [C]	Delete these entries	
59	31	7 10[8] [D]	Change "Form FO 29A" to "Form FO 29E"	
60	31	7 10[8] [E][a]	Change "Form FO 29A" to "Form FO 29E"	
61	32	7 10[8] [F]	Change "either Step 7 2[2] or Steps 7 8[4] through 7 8[6]" to "Step 7 2[2] and Steps 7 8[3] through 7 8[5]"	
62	32	7 10[8] [F][a] & [b]	Change "FO 29B" to "FO 29E"	
63	32	7 10[9]	Change "FO 29B for either Column 4 or 6" to "FO 29E for either Column 6 or 7"	
64	32	7 10[9] [A]	Delete this entry	
65	32	7 10[B] [C] & [D]	Change "FO 29B" to "FO 29E" (three occurrences)	

DMR (continuation sheet)

Page 5 of 6

9/16/94 *low*

Refer to 1-A01-PPG-001 for Processing Instructions

Printor Type All Information (Except Signatures)

25 DMR No 94-DMR-001741

2 or 3 Document Number/Revision

4-H46-ENV-OPS-FO 29/Rev 0

5 Document Title

Disposition of Soil and Sediment Investigation-Derived Materials

8 Item	9 Page	10 Step	11 Proposed Modifications
66	33-36	7 11	Every time this header appears, delete "(Form FO 29C)" This occurs on pages 33 through 36
67	33	7 11	Note 1, 2nd bulleted item Change "as determined in Section 7 10, or the TCLP Regulatory" to "as determined in Section 7 10, and the TCLP Regulatory"
68	33	7 11	Note 1 1 Change "FO 29C" to "FO 29E" 2 At the end of this note, append " In addition, the IDM must contain no constituents that exhibit RCRA characteristics of Ignitability, Reactivity, or Corrosivity as determined in Section 7 2 2 "
69	33	7 11	Note 2 Change "Form FO 29C in Accordance with Appendix 5, Inclusive Risk Analysis" to "Form FO 29E"
70	33	7 11[1]	Change "Form FO 29A" to "Form FO 29E"
71	33	7 11[2] & [3]	Delete these entries
72	33	7 11[4]	Change "FO 29C" to "FO 29E"
73	33	7 11[4] [A]	Delete the first sentence
74	34	7 11[4] [B]	Delete this entry
75	33	7 11[5]	1 Change "IF an organic compound or metal has values recorded on Form FO 29C, Columns 2 and 3" to "IF a constituent has a carcinogenic RBC" 2 Change "Column 3" to "the appropriate RBC" on entry [A] 3 Change "FO 29C" to "FO 29E" on entries [A] through [D] 4 Change "Column 4" to "Column 8" on entries [B] and [C]
76	34	7 11[6]	1 Change "IF an organic compound or metal has a value recorded on Form FO.29C, Columns 2 and 5" to "IF a constituent has a noncarcinogenic RBC" 2 Change "Column 5" to "the appropriate RBC" on entry [A] 3 Change "FO 29B" to "FO 29E" on entries [A] through [D] 4 Change "Column 6" to "Column 9" on entries [B] and [C]
77	35	7 11[7]	Change "Form FO 29C for both Columns 4 and 6" to "Form FO 29E for both Columns 6 and 7"
78	35	7 11[7]	Delete this entry
79	35	7 11[7] [B] thru [D]	Change "FO 29C" to "FO 29E"
80	35	7 11[8]	Change "Form FO 29C for either Columns 4 or 6" to "Form FO 29E for either Column 6 or 7"
81	35	7 11[8] [A]	Delete this entry
82	35	7 11[8] [B] thru [D]	Change "FO 29C" to "FO 29E"
83	36	7 12[1]	1 Delete the first bulleted entry "Form FO 29A, Column 5, is No for all metals" 2 2nd bulleted entry Change "Both the TOTAL (or GRAND TOTAL) block on Form FO 29B, Columns 4 and 6, or on Form FO 29C, Columns 4 and 6, are both less" to "All TOTAL (or GRAND TOTAL) blocks on Form FO 29E, Columns 6, 7, 8, and 9 are less" 3 3rd and 4th bulleted entries Change "FO 29A" to "FO 29E" 4 Last bulleted entry Change "block is checked" to "block is not checked"

DMR (continuation sheet)

Page 6 of 6

9/16/94 *lmc*

Refer to 1-A01-PPG-001 for Processing Instructions
 Printor Type All Information (Except Signatures)

25 DMR No 94-bm2-001741

2 or 3 Document Number/Revision			5 Document Title
4-H46-ENV-OPS-FO 29/Rev 0			Disposition of Soil and Sediment Investigation-Derived Materials
8 Item	9 Page	10 Step	11 Proposed Modifications
84	36	7 12[2]	1 Change "FO 29A, Column 8" to FO 29E, Column 4" 2 Change "Form FO 29B, in either Columns 4 or 6" to "Form FO 29E, in either Columns 6 or 7" 3 Before "THEN " add" "OR the IDM contains constituents that exhibit RCRA characteristics of Ignitability, Reactivity, or Corrosivity as determined in Section 7 2 2 "
85	37	7 12[3]	Change "FO 29C, in either Columns 4 or 6" to "FO 29E, in either Columns 8 or 9"
86	37	7 12[3] [B]	Change "substances greater than" to "substances with risks greater than"
87	38-39	8[1], 8[2], & 8[3]	1 Delete the words "as appropriate" 2 Delete the three bulleted entries "Form FO 29A", "Form FO 29B", and "Form FO 29C"
88	43		Delete this page
89	44		Change "Page 2 of 2" to "Page 1 of 1"
90	51& 52		Delete these pages
91			Renumber sections, appendices, and pages as appropriate
92	All		Change "ERM" to "ERPD"
93	All		Change "RFP" to "RFETS"

enc 10/6/94

INFORMATION
ONLY

page 1 of 67

This is a
CONTROLLED DOCUMENT
EG&G - ROCKY FLATS PLANT
ENVIRONMENTAL MANAGEMENT
This is a RED Stamp

Rocky Flats Plant

4-H46-ENV-OPS-FO.29

REVISION 0

DISPOSITION OF SOIL AND SEDIMENT INVESTIGATION-DERIVED MATERIALS

APPROVED BY [Signature] / SG STIGER / 5-17-94
Associate General Manager, Print Name Date
Environmental Restoration Management

[Signature] For / M.C. Brooks / 5-17-94
Quality Assurance Program Manager, Print Name Date
Environmental Restoration Management

CONCURRENCE BY No Signature per letter from Jessie M. Roberson (ER BM 05819)
Assistant Manager, Print Name Date
Environmental Restoration Division
DOE, Rocky Flats Field Office
to Sue G. Stiger

Environmental Protection Agency Approval Required ☒ Yes ☐ No

Responsible Organization Environmental Restoration Management Effective Date 6-24-94 Jar

CONCURRENCE BY THE FOLLOWING DISCIPLINES IS DOCUMENTED IN THE
PROCEDURE HISTORY FILE

ERM Remediation Project Management
ERM Geosciences
ERM Environmental Engineering & Technology
ERM Environmental Operations Management
ERM Sample Management
ERM Solar Ponds Project
Radiological Engineering
Industrial Hygiene
Occupational Safety

USE CATEGORY 3

ORC review not required

Periodic review frequency 1 year from the effective date

DOCUMENT CLASSIFICATION REVIEW WAIVER
PER R.B. HOFFMAN, CLASSIFICATION OFFICE
JUNE 11, 1991

5/12/94

LIST OF EFFECTIVE PAGES

94-DMR-001226
94-DMR-001741

Pages

Effective Date

Change Number

1-70
5, 37, 37A
1-67

05/31/94
07/15/94
10/07/94

94-DMR-001226
94-DMR-001741

TOTAL NUMBER OF PAGES 67 (Including Appendices)

TABLE OF CONTENTS (continued)

	<u>Section</u>	<u>Page</u>
94-DMP-001741	7 8 TCLP Comparison	26
	7 9 IDM RCRA Constituents of Concern	27
	7 10 Performing RCRA Risk Analysis	29
	7 11 Performing Inclusive Risk Analysis	33
	7 12 Managing IDM	36
	8 RECORDS	38
	9 REFERENCES	39
	<u>Appendixes</u>	
94-DML-001741	Appendix 1, IDM Evaluation Flow Chart	41
	Appendix 2, TCLP Determination and Form FO 29D, Adequacy Determination	43
	Appendix 3, IDM RCRA Constituents of Concern	44
	Appendix 4, TCLP Regulatory Levels and Table of Risk-based Concentrations	50
	Appendix 5, Form FO 29E, Computer-generated Classification of IDM	61
	Appendix 6, Risk-analysis Method	62

1.

PURPOSE

This procedure is a procedure for classifying the soil and sediment investigation-derived material (IDM) generated from environmental investigations. Specifically, this procedure is used to determine a risk-based disposition of soil and sediment drums being managed in accordance with 4-F99-ENV-OPS-FO 23, Management of Soil and Sediment Investigation-derived Materials. This procedure, although specific for drums, may be extended to other containers such as crates or half crates, and to uncontained waste piles.

2.

SCOPE

This procedure applies to all EG&G Rocky Flats, Inc. (EG&G) Environmental Restoration Program Division (ERPD) employees and subcontractors involved in the disposition of soil and sediment IDM. A flow chart outlining the processes described in this procedure is shown in Appendix 1, IDM Evaluation Flow Chart.

This procedure addresses the following topics:

- Review of Form FO 23A
- Review of process knowledge and analytical results [in accordance with Appendix 2, Toxicity Characteristic Leaching Procedure (TCLP) Determination and Form FO 29D, Adequacy Determination (Form FO 29D)]
- Adequacy Determination Form (in accordance with Form FO 29D, Adequacy Determination Form in Appendix 2)
- Data management
- Comparison of reported detection limits (DL)
- Calculating average concentrations
- Background comparison of metals
- TCLP comparison
- IDM RCRA Constituents of Concern (in accordance with Appendix 3, IDM RCRA Constituents of Concern)
- Performing RCRA risk analysis
- Performing inclusive risk analysis
- Managing IDM

3. OVERVIEW

94-DMR-001741

This overview provides a descriptive summary of the steps required to complete 4-H46-ENV-OPS-FO 29. Chemical concentrations of various constituents in soils and sediments in drums are classified either by analytical results from corresponding field samples or by analytical results from IDM samples. The analyses are performed in accordance with approved individual project-specific work plans. Analytical results are recorded on Form FO 29E (Appendix 5). Radioactivity determinations will be addressed at a later date. Measured levels of organic compounds and metals detected in the soil and sediment IDM are compared with criteria defined in this procedure and are ultimately classified as one of the following:

Case No 1

Soil and sediment that contain IDM RCRA Constituents of Concern and/or IDM Constituents of Concern, which do not exhibit the characteristics of corrosivity, reactivity, or ignitability, which do not exceed adjusted TCLP regulatory levels, the RCRA risk-analysis criteria, the inclusive risk-analysis criteria, or that do not contain any metals above background and organics above the DL, and can be managed and disposed of in accordance with 4-F99-ENV-OPS-FO 23. However, an independent radiological evaluation is still required.

Case No 2

Soil and sediment that contain IDM RCRA Constituents of Concern (Appendix 3) which exhibit the characteristics of corrosivity, reactivity or ignitability, or exceed adjusted TCLP regulatory levels and/or exceed RCRA risk-analysis criteria, and will require management as a RCRA hazardous waste. However, an independent radiological evaluation is still required.

Case No 3

94-DMR-001741

Soil and sediment that do not exhibit the characteristics of corrosivity, reactivity, and ignitability, do not exceed adjusted TCLP regulatory levels, or the RCRA risk analysis criteria, but do not contain IDM Constituents of Concern exceeding inclusive risk-analysis criteria, and require management in accordance with the site-specific Record of Decision (ROD) when issued. However, an independent radiological evaluation is still required.

3.1 Background Comparison

It is unnecessary to assess the impact of metals detected at naturally occurring levels. To define the presence of constituents above background levels in soils and sediments, the concentrations of detected metals in the materials (or the average concentration when the drum contains IDM from more than one sampling interval in the borehole) will be compared with the mean plus two standard deviations (mean + 2SD) of background data, as defined using data from the Department of Energy (DOE) Background Geochemical Characterization Report. If the concentration of a metal is below the background mean + 2SD, the metal will be dropped from further consideration. If a background mean + 2SD cannot be obtained for a particular metal, that metal will be retained for further consideration.

3.2 TCLP Constituent of Concern Comparison

IDM with metals detected in concentrations above background mean + 2SD, metals with no associated mean + 2SD, and organic compounds detected above the Rocky Flats Environmental Database System (RFEDS) DL will be evaluated to determine if they include TCLP Constituents of Concern. TCLP Constituents of Concern are those constituents defined in 6 CCR 1007-3 Section 261.24. If TCLP Constituents of Concern are present, a TCLP Constituent of Concern comparison will be performed.

TCLP regulatory levels are determined for leachate extracted from a solid matrix and are expressed in terms of mg/L. However, soil and sediment IDM analytical results are reported in terms of mg/kg. The TCLP test itself has not been performed on most Rocky Flats Environmental Technology Site (RFETS) investigation samples. Therefore, an approximation factor (AF) is used to convert the TCLP regulatory level to a soil concentration for comparison to soil analytical results. An AF of 20 has been selected for this purpose as required by the SW-846 Method 1311 for material containing greater than or equal to 0.5% solids. No TCLP comparison will be performed for constituents that do not have established TCLP regulatory levels, as identified in 6 CCR 1007-3 Section 261.24 or in Appendix 6, TCLP Regulatory Levels and Table of Risk-based Concentrations.

94-Dm2-001741

3.2 TCLP Constituent of Concern Comparison (continued)

If any one TCLP constituent concentration in the IDM exceeds the AF-adjusted TCLP regulatory level, then the corresponding drummed soil or sediment IDM will be managed as a RCRA waste. Even if an AF-adjusted TCLP regulatory level is exceeded, the remaining constituents in the IDM will be retained for evaluation in the RCRA risk analysis described in this procedure. Furthermore, constituents that do not exceed the adjusted TCLP comparison will be retained for evaluation in the RCRA and/or inclusive risk analysis described in this procedure.

3.3 IDM RCRA Constituents of Concern Evaluation and RCRA Risk Analysis

After the IDM has been evaluated to determine if it contains any TCLP Constituents of Concern, the IDM will then be evaluated to determine if any other IDM RCRA Constituents of Concern are present. Appendix 3 contains IDM RCRA Constituents of Concern. The IDM RCRA Constituents of Concern listed in Appendix 3 include all RCRA Appendix VIII constituents, except tentatively identified compounds (TICs), that have been reported as of 03/01/94 in the RFEDS. If a Constituent of Concern is reported from RFEDS but is not listed in Appendix 3, then the Constituent of Concern will be compared with Appendix VIII to 6 CCR 1007-3 Part 261 to determine if the Constituent of Concern is a RCRA waste. If any IDM RCRA Constituents of Concern are present, or any identified RCRA waste is present, a RCRA risk analysis will be performed. If IDM RCRA Constituents of Concern are not present, an inclusive risk analysis will be performed.

Both the RCRA and inclusive risk analyses evaluate the human exposure pathways of direct ingestion of soil, dermal absorption of constituents from soil, inhalation of suspended (airborne) soil, and ingestion of food grown in contaminated soil. Chemical-specific risk-based concentrations (RBCs) for soil are derived such that the risk from long-term exposure to the chemical concentration in soil corresponds to either a 10^{-6} excess cancer risk or a Hazardous Quotient (HQ) of 1 for noncarcinogenic effects. Ratios of the chemical concentration in the IDM to the RBC are calculated. Then, the ratios of the constituent concentrations to the RBCs are summed, yielding a sum of carcinogenic risk ratios and a sum of noncarcinogenic hazard ratios.

94-DMD-001741

3.3 IDM RCRA Constituents of Concern Evaluation and RCRA Risk Analysis (continued)

For IDM RCRA Constituents of Concern, if either the sum for carcinogenic effects exceeds 1 (representing a cumulative 10^{-6} risk level) for exposure to multiple carcinogens or the sum for noncarcinogenic effects exceeds 1 [representing a cumulative Hazard Index (HI) of 1], the RCRA risk-analysis criteria are exceeded. If the RCRA risk-analysis criteria are exceeded, the IDM will be managed as a RCRA waste. If the IDM do not exceed the RCRA risk-analysis criteria, the IDM will be further evaluated in the inclusive risk analysis.

3.4 Inclusive Risk Analysis

An inclusive risk analysis will be performed on all IDM that did not exceed the RCRA risk-analysis criteria. The inclusive risk analysis is similar to the RCRA risk analysis except that all organic compounds detected above DLs and all metals above background levels are assessed whether they are IDM RCRA Constituents of Concern or not. The ratios of the constituent concentrations to the RBCs are summed as is done in the RCRA risk analysis.

For all IDM Constituents of Concern, if either the sum for carcinogenic effects exceeds 1 (representing a cumulative 10^{-6} risk level) or the sum for noncarcinogenic effects exceeds 1 (representing a cumulative HI of 1), the inclusive risk-analysis criteria are exceeded. If the inclusive risk-analysis criteria are exceeded, the IDM will be managed as a non-RCRA [or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)] waste. If the inclusive risk-analysis criteria are not exceeded, the IDM will require management in accordance with 4-F99-ENV-OPS-FO 23.

3.5 Final IDM Classification

Based upon the results of the steps outlined in this procedure, the IDM will ultimately be classified as one of the following:

Case No. 1

If the soil and sediment IDM previously evaluated did not exhibit the characteristics of corrosivity, ignitability, or reactivity, did not exceed the adjusted TCLP regulatory level, the RCRA risk-analysis criteria, and the inclusive risk-analysis criteria, or did not contain any metals above background and organic components above the DL, then the IDM can be managed as uncontaminated and disposed of in accordance with 4-F99-ENV-OPS-FO 23. However, an independent radiological evaluation is still required.

94-DMR-001741

3.5 Final IDM Classification (continued)

Case No 2

If the soil and sediment IDM previously evaluated exhibited the characteristics of corrosivity, ignitability or reactivity or exceeded the adjusted TCLP regulatory level, and/or the RCRA risk-analysis criteria, then the IDM will require management as a RCRA hazardous waste. However, an independent radiological evaluation is still required.

Case No 3

If the soil and sediment IDM previously evaluated exceeded the inclusive risk-analysis criteria, then the IDM will require management as a non-RCRA waste containing Constituents of Concern in accordance with the site-specific ROD, when issued. However, an independent radiological evaluation is still required.

4 DEFINITIONS

Toxicity Characteristic Leaching Procedure (TCLP). An analytical method for extracting leachates to determine the mobility of both organic and inorganic contaminants present in liquid, solid, and multiphasic wastes. TCLP Constituents of Concern are those constituents as defined in 6 CCR 1007-3 Section 261.24. Although analytical results for soil and sediment IDM are expressed in terms of mg/kg, the results of TCLP analyses are expressed in terms of mg/L, and for these purposes, are considered equivalent to parts per million (ppm). In this procedure, the TCLP process is simulated by multiplying the TCLP values by an Approximation Factor (AF) of 20.

Reported Detection Limits (DLs). Detection limits reported in the RFEDS database.

Risk-based Concentrations (RBCs). Concentration levels for individual chemicals in soil that correspond to either a 10^{-6} excess cancer risk or an HQ of 1 for noncarcinogenic effects.

Mean + 2SD. Threshold limits of background data, as defined using data from the DOE Background Geochemical Characterization Report. The mean + 2SD provides the value to define the presence of constituents above background levels in soils and sediments. The mean + 2SD will be used in this procedure. Because most metal distributions in the background data are neither normal nor lognormal, the more conservative approach, in other words, the use of the mean and standard deviation as computed assuming a normal distribution, will be used for this procedure.

94-DME-001741

5. RESPONSIBILITIES

|5.1 ERPD Environmental Engineering & Technology (EE&T)

Documents personnel qualifications to perform this procedure in the project Quality Assurance (QA) files

Ensures that this procedure is performed correctly

|5.2 ERPD Environmental Operations Management (EOM)

Manages soil and sediment IDM in permitted and interim-status storage areas in accordance with applicable regulations and procedures

|5.3 ERPD Project File Center (PFC)

Manages quality-related forms transmitted to the ERPD PFC in accordance with 2-G18-ER-ADM-17 01, Quality Assurance Records Management

|5.4 ERPD Project Manager (PM)

Evaluates analytical data from RFEDS to determine disposition of soil and sediment IDM

Approves the data adequacy determination form

Approves final soil determinations

Assigns waste codes and labels the soil and sediment IDM

|5.5 ERPD Risk Management Personnel

Conducts or oversees all risk analyses required by this procedure

Recalculates risk-based soil concentrations by using up-to-date toxicity information on an annual basis in accordance with this procedure

Revises the IDM RCRA Constituents of Concern list and the IDM Constituents of Concern list on an annual or as-needed basis as new Constituents of Concern are identified

94-Dm 2-001741

5.6 ERPD Sample Management - RFEDS

Conducts data management

6. TRAINING

| ERPD PM

- 94-DNR-001741
- [1] Ensure that all personnel are appropriately trained and qualified to perform the duties, tasks, and responsibilities of their assigned jobs
 - [2] Ensure that personnel training and qualification requirements for activities described in this procedure have been identified by the ERPD Training and Qualification group
 - [3] Ensure that ERPD EG&G subcontractor personnel meet the required training and qualifications specified by the Training and Qualification group
 - [4] Ensure that documentation and verification of both ERPD-specific training and Performance Based Training has been documented by the Training and Qualification group

7. INSTRUCTIONS

7.1 Review of Form FO.23A

General procedures for the management of the drums containing soil and sediment IDM are contained in 4-F99-ENV-OPS-FO 23 Form FO 23A, Soil and Sediment IDM Form, contains information to be used in the implementation of this procedure. The data reported on Form FO 23A were obtained in accordance with 4-F99-ENV-OPS-FO 23

NOTE *Appendix 1 contains a flow chart outlining the processes described in this procedure*

ERM PM

- [1] Obtain the applicable Form FO 23A or equivalent information
- [2] **IF** a completed Form FO 23A or equivalent information is **NOT** available,
THEN:
 - [A] Exit this procedure
 - [B] Go to 4-F99-ENV-OPS-FO 23
- [3] **IF** a completed Form FO 23A is available,
THEN review the information on process knowledge on Form FO 23A

94-DMR-001741

7.2

Review of Process Knowledge and Analytical Results

ERM PM

- [1] Record the following as required on Form FO 29E
- Rocky Flats Project
 - Date
 - ERM Project Manager
 - Soil Sample Location
 - Soil Depth Interval
- [2] Check (✓) the appropriate box on Form FO 29E to show whether process knowledge indicates that the IDM being evaluated potentially contains constituents with the following characteristics in accordance with 6 CCR 1007-3 Sections 261 20 - 261 23
- Corrosive
 - Ignitable
 - Reactive

7.3

Adequacy Determination Form

Form FO 29D documents that enough appropriate and adequate analytical information to perform a waste characterization evaluation is associated with each drum of IDM. Analytical information is appropriate and adequate when each drum has at least one set of data from each analytical method listed on the form. However, analytical information may still be considered appropriate and adequate where discrepancies or missing information are explained and documented as to the relevance of each analytical method by the ERPD PM. A reason must be provided for analyses that were not performed and that rationale must be documented on Form FO 29D. If the ERPD PM has determined that additional analytical methods and information would not assist in performing a waste characterization evaluation, then that (those) analytical method(s) would not be required to have been completed in order for the analytical information to be considered appropriate and adequate.

ERPD PM

- [1] Obtain an Adequacy Determination Form (Form FO 29D) for each drum of IDM to be evaluated through the instructions specified in this procedure

94-DMR-001741

7 3

Adequacy Determination Form (continued)

ERPD PM (continued)

[2] Record the following as required on Form FO 29D

- Drum number
- Boring location
- Individual Hazardous Substance Site (IHSS) location
- Associated sample numbers
- Analytical method names for each sample

NOTE 1 *Analytical samples used to classify soils and sediments are to be gathered in accordance with approved project-specific work plans*

NOTE 2 *Associated sample numbers and analytical method names for each drum of IDM can be obtained by querying the RFEDS database and specifically requesting this information*

NOTE 3 *When organic analytes in the database set are B-qualified (meaning that these analytes were detected in laboratory blanks), the data are usable but should be flagged B-qualified data will be used in the risk assessment computations, and a comment will be added to either Form FO 29E documenting that B-qualified data were used. If drums of IDM that had B-qualified data associated with them are determined to be above RCRA or CERCLA risk assessment criteria, the drum of IDM may require further evaluation to determine if the blank contamination (B-qualified data) inappropriately contributed to the determination of risk associated with the drum*

[3] **IF** associated sample numbers and analytical method names for each sample are available from RFEDS,

THEN record on Form FO 29D whether the following analytical suites are available by checking [✓] the Yes or No column, as appropriate

- VOAs
- BNAs [or semi-volatiles (SVOAs)]
- Pesticides/PCBs
- Metals
- Rads

94-DMR-001741

7.3

Adequacy Determination Form (continued)

ERPD PM (continued)

- [4] IF the response in Step 1 is Yes for all of the analytical suites,
THEN:

[A] Sign or initial and date Form FO 29D

[B] Go to Step

- [5] IF the response in Step 1 is No for any of the analytical methods,
THEN:

[A] Provide an answer to the question, *If no, why?*, on Form FO 29D for each
No response

[B] Perform the evaluation stipulated in Step 7.3[6] or [7], as appropriate

[C] The answer to this question will vary widely. The ERPD PM may need to
refer to the approved project-specific work plan or to historical release
reports to confirm that this particular type of contamination was not of
concern in the area from which the drum of IDM was obtained

- [6] IF another analytical sample can be used to provide a more comprehensive
waste characterization profile for the drum of IDM under evaluation,
THEN record a Yes by *Can another sample be used to characterize this drum?*
on Form FO 29D

Analytical samples associated with nearby boreholes may, in some instances, be
used to provide a more comprehensive waste characterization profile for the
drum of IDM under evaluation. Whether an association using the following
hierarchy is appropriate will be left to the professional discretion and judgment
of the ERPD PM

7.3

Adequacy Determination Form (continued)

NOTE 1 *The following hierarchy has been developed to assist in determining which samples can be used to provide missing analytical information. Whether a sample was taken at a more shallow depth within the same location (borehole) that was sampled for the missing analytical information will need to be determined. If such a sample is not available, the next consideration should be given to the closest borehole within the same IHSS for a sample taken to the same depth as the samples in the drum. If that information is not available, a sample may be used from up to that depth from any borehole within the IHSS. The final step in the hierarchy is to use a sample from below the depth of the other samples in the same borehole.*

NOTE 2 *Historical information regarding sampling plan rationale for various areas may be obtained from individuals knowledgeable about patterns of contamination at the RFETS, sampling plans and sampling strategies for the particular area from which the drum of IDM was obtained, or from the approved project-specific work plans.*

ERPD PM (continued)

- [7] **IF** another analytical sample **CANNOT** be used to provide a more comprehensive waste characterization profile for the drum of IDM under evaluation,
THEN record a No by *Can another sample be used to characterize this drum?* on Form FO 29D
- [8] **WHEN** Form FO 29D is complete,
THEN:
- [A] Sign or initial and date Form FO 29D
- [B] Go to Step 7 3[9]
- [9] Determine whether data are adequate, based upon the information on Form FO 29D
- [10] **IF** the analytical data are **NOT** adequate to characterize the drummed IDM,
THEN:

94-DMR-001741

7.3

Adequacy Determination Form (continued)

ERPD PM (continued)

[A] Exit this procedure

[B] Review the approved project-specific work plan

If the data are not adequate to characterize the drummed IDM, the ERPD PM may decide to resample the drummed IDM. The ERPD PM may request that a resample be taken of drummed IDM in accordance with 5-21000-OPS-FO 20, Rev 0, Sampling Liquids and Solids from Environmental Materials Containers (when issued)

[11] IF the analytical data are adequate to characterize the drummed IDM,
THEN perform the data management steps as stipulated in Section , Data
Management

7.4

Data Management

This section should be performed by a person with experience in data management. Data management can either be done on a drum-by-drum basis or for a larger data set.

ERPD PM

[1] Do NOT use this procedure until all analytical information is available for a drum.

7.4

Data Management (continued)

ERPD PM (continued)

- [2] **WHEN** the associated sample numbers are available for each drum,
THEN request the analytical results from RFEDS

The information required to complete the data management steps are

- Location (that is, borehole number)
- Sample number
- Sample type [such as sediment (SD) or borehole (BH)]
- Sample QA/QC code [such as REAL, duplicate (DUP), or rinsates (RNS)]
- Sample QC partner
- Sample date
- Test group code (that is, method name)
- Result type [such as target (TRG or TR_n), dilution (DIL or DL_n), replicate (REP or RP_n), or re-extraction (REX or RX_n, where n=1,2,3)]
- Chemical
- Parameter code
- Lab QA code
- Result
- Unit measure
- Error
- Qualifier
- Detect limit
- Validation
- Matrix
- Secondary result type

7.4 Data Management (continued)

94-DMP-001741

ERPD Sample Management - RFEDS

- [3] Do NOT provide to the ERPD PM the following information or analytical results on either the RFEDS hardcopy or electronic copy, as appropriate
- Tentatively identified organic compounds (TICs)
 - Nutrient species from the metals data (calcium, iron, magnesium, potassium, and sodium)
 - Silicon (or silica)
 - All analytes with the test method of WQPL except cyanide, nitrate or nitrite/nitrate, pH, and ignitability
 - All rinsates (RNS), trip blanks (TB), and matrix spikes/matrix spike duplicates (MS/MSDs), however, record these sample numbers to prove that they were not overlooked in the evaluation
 - All sample numbers belonging to the RNS, TBs, and MS/MSDs from the list of sample numbers associated with the drum
- [4] IF both a validated and an unvalidated result are available for a sample or analyte pair,
THEN do NOT provide the unvalidated result to the ERPD PM
- [5] Determine if a sample has both a *DIL* (or DL_n) or *REX* (or RX_n) and *TRG* (or TR_n) (lab QA codes) result for any analyte
- [A] IF the *DIL* (or DL_n) is U-qualified (nondetect),
THEN do NOT provide the *TRG* (or TR_n) (E-qualified) record for that analyte
- [B] IF one of the pair of results is E-qualified,
THEN:
- [a] Do NOT provide the E-qualified record for that analyte
 - [b] Retain the other result

94-DMP-001741

7.4 Data Management (continued)

94-DME-001741

ERP Sample Management - RFEDS (continued)

[C] IF the *TRG* (or *TR_n*) result has no data qualifier,
THEN:

- [a] Retain the *TRG* (or *TR_n*) record for that analyte
- [b] Do NOT provide the *DIL* (or *DL_n*) or *REX* (or *RX_n*) for that analyte

- [6] Ensure that the analytical units for the soil and sediment samples are consistent and conform to the following
- VOA, BNA, and PEST - UG/KG
 - Metals - MG/KG
 - Radionuclides (except tritium) - pCi/g
 - Tritium - pCi/L
 - Cyanide, Nitrate, and Nitrite/Nitrate - UG/G (equivalent to MG/KG)

Any data reported in units per liter (except tritium) cannot be evaluated by the computer program used in this procedure. The RBCs, TCLP comparison, and background mean + 2SD comparison included herein cannot be used for liquids

- [7] Determine if the QC partner (the REAL) is available for all DUPs

[A] IF the REAL is available,
AND both the REAL and DUP contain detected values,
THEN:

- [a] Average the DUP and REAL results for all of the detected compounds
- [b] Replace the REAL result with the average
- [c] Delete the original DUP record result

[B] IF both the REAL and DUP results are U-qualified,
THEN retain the sample concentration with the smaller number in the result column

94-bmr-00174

7.4 Data Management (continued)

ERPD Sample Management - RFEDS (continued)

[C] IF either the REAL or DUP has a detected value and the other is U-qualified,
THEN:

[a] Retain the detected value

[b] Delete the U-qualified record

[8] Convert all results, units, and detection limits to MG/KG for nonradionuclides

[A] IF the laboratory reported the result in UG/KG,
THEN convert the units to MG/KG, and divide the numbers in the result and
detection limit columns by 1000

Results for cyanide, nitrate, nitrate/nitrite are given in units of UG/G. Because
UG/G is equivalent to MG/KG, only the unit's designation needs to be changed,
the values in the result and detection limit columns remain unchanged

94-bmr-00174

ERPD PM

[9] WHEN the data management has been completed,
THEN review the results

[10] IF all analytical results for a particular constituent are U-qualified,
THEN do NOT evaluate this analyte any further

[11] IF both detected and U-qualified analytical or all detected results exist for a particular
constituent,
THEN:

[A] Record the name of the analyte on Form FO 29E, Column 1

[B] Calculate the average concentration for that constituent

94-bmr-00174

94-DMR-001741

7.5

Calculating Average Concentrations

ERPD PM

- [1] IF there is more than one analytical result for a particular analyte for an individual drum,
THEN calculate an average concentration

The average concentration of detected constituents is calculated by replacing each U-qualified result with the detection limit divided by 2 and then using this value when the arithmetic mean is calculated on an analyte-by-analyte basis

- [2] IF the analytical results for a particular constituent in an individual drum are all U-qualified,
THEN do NOT evaluate the analyte any further
- [3] Enter the arithmetic mean concentration on Form FO 29E, Column 1, as appropriate
- [4] IF metal constituents are reported as being present in the IDM,
THEN go to Section 7 6, Metals Comparison
- [5] IF metal constituents are NOT reported as being present in the IDM,
THEN go to Section 7 7, TCLP Comparison

94-DMR-001741

7.6 Metals Comparison

ERPD PM

- [1] Compare the arithmetic mean value for each metal (obtained in the following steps) to the background mean + 2SD for that metal by using the mean + 2SD for geologic materials from the upper hydrostratigraphic unit [UHSU]

Table 1, Summary Statistics for UHSU Metals in Geologic Materials, presents the background mean + 2SD for geologic materials from the UHSU to be used in implementing this procedure

- [2] **IF** the average concentration of the metal is above the background mean + 2SD, **OR** if no background mean + 2SD exists for that particular metal, **THEN** enter the analyte name on FO 29E, Column 1
- [3] **IF** the average concentration of the metal is **NOT** above the background mean + 2SD, **THEN** do not record that metal in any FO 29E columns, including Column 1
- [4] Remove from further evaluation any metal below the value of the background mean + 2SD
- [5] **IF** metals are the only constituents in the soil and sediment IDM, **AND** each metal is below the respective background mean + 2SD, **THEN**:
- [A] Record in FO 29E, Column 1 the following message "All Analytes Non-Detect/Below Background"
- [B] Sign or initial Form FO 29E
- [C] Go to Section 7 11

94-DMR-001741

Table 1 Summary Statistics for Metals in UHSU Geologic Materials

Analyte	Geologic Unit	Sample Size, N	Non-Detect	Detect	Percent Detects	Mean	Standard Deviation	Mean + 2SD	Units
Aluminum	UHSU	98	1	97	98 98	12674	11372	35418	MG/KG
Antimony	UHSU	66	56	11	16 67	6 28	1 89	10 06	MG/KG
Arsenic	UHSU	99	29	70	70 71	3 5	4 42	12 34	MG/KG
Barium	UHSU	99	11	88	88 89	96 2	96 5	289 2	MG/KG
Beryllium	UHSU	99	18	81	81 82	4 59	4 82	14 23	MG/KG
Cadmium	UHSU	81	75	6	7 41	0 6	0 24	1 08	MG/KG
Calcium	UHSU	99	1	98	98 99	7053	16179	39411	MG/KG
Cesium	UHSU	95	94	1	1 05	102 6	32 7	168	MG/KG
Chromium	UHSU	99	15	84	84 85	18	25	68	MG/KG
Cobalt	UHSU	99	77	22	22 22	6 86	5 33	17 52	MG/KG
Copper	UHSU	99	5	94	94 95	12 55	12 8	38 15	MG/KG
Iron	UHSU	99	0	99	100 00	14532	13257	41046	MG/KG
Lead	UHSU	99	1	98	98 99	10 83	7 09	25 01	MG/KG
Lithium	UHSU	99	38	61	61 62	9 75	8 38	26 51	MG/KG
Magnesium	UHSU	99	4	95	95 96	2875	3232	9339	MG/KG
Manganese	UHSU	99	0	99	100 00	218	342	902	MG/KG
Mercury	UHSU	86	64	22	25 58	0 167	0 147	0 461	MG/KG
Molybdenum	UHSU	99	49	50	50 51	15 39	9 01	33 41	MG/KG
Nickel	UHSU	96	14	82	85 42	19 14	20 86	60 86	MG/KG
Potassium	UHSU	98	47	51	52 04	1545	1882	5309	MG/KG
Selenium	UHSU	82	80	2	2 44	0 996	1 253	3 502	MG/KG
Silver	UHSU	83	50	33	39 76	5 66	9 41	24 48	MG/KG
Sodium	UHSU	99	82	17	17 17	849	399	1647	MG/KG
Strontium	UHSU	99	63	36	36 36	43 4	42 1	127 6	MG/KG
Thallium	UHSU	75	72	3	4 00	1 22	1 17	3 56	MG/KG
Tin	UHSU	92	67	25	27 17	67	110	287	MG/KG
Vanadium	UHSU	99	2	97	97 98	31 5	28 5	88 5	MG/KG
Zinc	UHSU	98	7	91	92 86	35 9	51 6	139 1	MG/KG

NOTE COMPUTED APRIL 7, 1994 USING DATA FROM 1993 BACKGROUND GEOCHEMICAL CHARACTERIZATION REPORT

94-DMR-0041

7.6 Metals Comparison (continued)

ERPDM (continued)

- [7] **IF** other constituents are present,
OR any metals exceed the background mean + 2SD,
THEN go to Section

7.7 TCLP Comparison

NOTE *If actual TCLP analysis was performed on any samples in a drum, then a straight TCLP comparison should be performed rather than using the approximation method described in Steps 7 8[3] through 7 8[5]*

ERPDM

- [1] **IF** any analytes are recorded on Form FO 29E, Column 1,
THEN determine if a TCLP regulatory level is available in Appendix 6, Table 6-1,
TCLP Constituents of Concern Maximum Contaminant Levels
ELSE go to Section 7 11
- [2] **IF** a TCLP regulatory level is available,
THEN multiply the TCLP regulatory level by the AF (20)
- [3] **IF** the AF-adjusted TCLP level is less than the constituent concentration in Form
FO 29E, Column 2
THEN record *Yes* in Column 4 for that constituent
- [4] **IF** the AF-adjusted TCLP level is greater than the constituent concentration in Form
FO 29E, Column 2,
THEN record *No* in Column 4
- [5] **IF** at least one *Yes* was recorded on FO 29E, Column 4,
THEN:
- [A] The IDM is considered RCRA waste Disposition as stated in Section 7 11[2]

94-DMP-001741

7.7 TCLP Comparison (continued)

ERPD PM (continued)

[B] Go to Section 7 8, IDM RCRA Constituents of Concern

[6] **IF** only *Nos* were recorded on Form FO 29E, Column 4,
THEN:

[A] Go to Section , IDM RCRA Constituents of Concern

7.8 IDM RCRA Constituents of Concern

ERPD PM

[1] Evaluate if any constituent listed on Form FO 29E, Column 1, is an IDM RCRA
Constituent of Concern

The IDM RCRA Constituents of Concern are identified in Appendix 3

[2] **IF** a constituent(s) listed on Form FO 29E, Column 1, is identified as an IDM RCRA
Constituent of Concern in Appendix 3,
THEN record *Yes* on Form FO 29E, Column 5, indicating that the constituent(s) is an
IDM RCRA Constituent of Concern

[3] **IF** a constituent(s) listed on Form FO 29E, Column 1, is **NOT** identified as an IDM
RCRA Constituent of Concern in Appendix 3,
THEN compare the constituent(s) with Appendix VIII to 6 CCR 1007-3 Part 261 to
determine if the constituent(s) is a RCRA waste

[4] **IF** the constituent(s) listed on Form FO 29E, Column 1, that is **NOT** identified as an
IDM RCRA Constituent of Concern in Appendix 3 but is listed as a RCRA waste in
Appendix VIII to 6 CCR 1007-3 Part 261,
THEN record *Yes* on Form FO 29E, Column 5, indicating that the constituent(s) is an
IDM RCRA Constituent of Concern

94-DMR-001741

7.8 IDM RCRA Constituents of Concern (continued)

ERPD PM (continued)

[5] **IF** the constituent(s) listed on Form FO 29E, Column 1, is **NOT** identified as an IDM RCRA Constituent of Concern in Appendix 3, **AND** is **NOT** listed as a RCRA waste in Appendix VIII to 6 CCR 1007-3 Part 261, **THEN** record *No* on Form FO 29E, Column 5, indicating that the constituent(s) is not an IDM RCRA Constituent of Concern

[6] **IF** no IDM RCRA Constituents of Concern are present, **THEN:**

[A] Forward Form FO 29E to ERPD Risk Management for performance of an inclusive risk analysis in accordance with Section , Performing Inclusive Risk Analysis

[7] **IF** IDM RCRA Constituents of Concern are present, **THEN:**

[A] Forward Form FO 29E to ERPD Risk Management to perform a RCRA risk analysis in accordance with Section , Performing RCRA Risk Analysis

If a constituent is not identified as an IDM RCRA Constituent of Concern in Appendix 3 but is a RCRA waste in Appendix VIII to 6 CCR 1007-3 Part 261, then ERPD Risk Management will include this constituent in the RCRA risk analysis and will calculate risk-based soil concentrations by using up-to-date toxicity information, as appropriate

94-DMR-001741

94-DMR-001741
| 7.9 **Performing RCRA Risk Analysis**

| NOTE *A RCRA risk analysis is performed for all IDM RCRA Constituents of Concern and all identified RCRA wastes. The results are recorded on Form FO 29E. A description of the calculation of RBCs is provided in Appendix 8, Risk-Analysis Method.*

| **ERPD Risk Management Personnel**

- | [1] Compare the analytical results for IDM RCRA Constituents of Concern listed on Form FO 29E, Column 2, with the RBCs for soil listed in Appendix 6, Table 6-2, IDM RCRA Constituents of Concern Carcinogens and Noncarcinogens Risk-based Concentrations for Soil, following the procedure described in this section
- | [2] Identify the carcinogenic and noncarcinogenic RBCs for each IDM RCRA Constituent of Concern in Appendix 6, Table 6-2

7.9 Performing RCRA Risk Analysis (continued)

ERPD Risk Management Personnel (continued)

[3] **IF** a RCRA constituent has a carcinogenic RBC,
THEN:

[A] Divide Column 2 by the appropriate RBC for each constituent on Form FO 29E

[B] Record the decimal fraction (ratio) on Form FO 29E, Column 6, for each constituent

[C] Sum all of the ratios on Form FO 29E, Column 6, and record the sum in the *TOTAL* block at the bottom of the column

[D] **IF** multiple pages for Form FO 29E are required,
THEN use the *GRAND TOTAL* block to sum the *TOTAL* blocks for the analysis

[4] **IF** an organic compound or metal has a value recorded on Form FO 29E, for both Columns 6 and 7,
THEN:

[A] Divide Column 2 the appropriate RBC for each constituent on Form FO 29E

[B] Record the decimal fraction (ratio) on Form FO 29E, Column 7, for each constituent

[C] Sum all of the ratios on Form FO 29E, Column 7, and record the sum in the *TOTAL* block at the bottom of the column

94-DMP-00174

[7.9 Performing RCRA Risk Analysis (continued)]

ERPD Risk Management Personnel (continued)

[D] IF multiple pages for Form FO 29E are required,
THEN use the *GRAND TOTAL* block to sum the *TOTAL* blocks for the analysis

[5] IF the *TOTALS* (or *GRAND TOTALS*) on Form FO 29E for both Columns 6 and 7 are
equal to or less than 1,
THEN:

[A] Forward Form FO 29E to ERPD PM

ERPD PM

[B] Review the answers provided on Form FO 29E for Step 7 2[2] and Steps 7 7[3]
through 7 7[5]

[C] IF at least one *YES* is recorded in response to the questions or evaluations
performed in either Step 7 2[2] or Steps 7 7[3] through 7 7[5],
THEN:

[a] Review and sign or initial Form FO 29E

[b] Go to Section 7 11

94-DMP-001741

7.9 Performing RCRA Risk Analysis (continued)

ERPDM (continued)

[D] IF all NOs were recorded in response to the questions or evaluations performed in Step 7 2[2] and Steps 7 7[3] through 7 7[5],
THEN.

[a] Review and sign or initial Form FO 29E

[b] Any concerns or problems with Form FO 29E can be addressed with the ERPDM Risk Management Analyst responsible for that particular risk analysis before the form is approved

[c] Forward Form FO 29E to the responsible ERPDM Risk Management Analyst

ERPDM Risk Management Personnel

[E] Perform an inclusive risk analysis on the drum of IDM in accordance with Section 7 10

[6] IF the TOTAL (or GRAND TOTAL, whichever is greater) on Form FO 29E for either Column 6 or 7 is greater than 1,
THEN:

[A] Sign or initial Form FO 29E

[B] Forward Form FO 29E to the ERPDM PM for approval

ERPDM

[C] Review and sign or initial Form FO 29E

Any concerns or problems with Form FO 29E can be addressed with the ERPDM Risk Management Analyst responsible for that particular risk analysis before the form is approved

[D] Go to Section 7 11

94-DMR-001741

7.10 **Performing Inclusive Risk Analysis**

NOTE 1 *An inclusive risk analysis is performed when either*

- *No IDM RCRA Constituents of Concern are present as determined in Section 7 8, or*
- *Both the total carcinogenic and noncarcinogenic ratios for IDM RCRA Constituents of Concern are equal to or less than 1 as determined in Section 7 9, and the TCLP Regulatory Levels are not exceeded as determined in Section 7 7*

NOTE 2 *Results of the inclusive risk analysis are recorded on Form FO 29E A description of the calculation of RBCs is provided in Appendix 8 In addition, the IDM must contain no constituents that exhibit RCRA characteristics of Ignitability, Reactivity, or Corrosivity as determined in Section 7 2[2]*

ERPD Risk Management Personnel

- [1] Compare the analytical results for IDM Constituents of Concern on Form FO 29E, Columns 1 and 2, with the RBCs for soil listed in Appendix 6, Table 6-3, IDM Constituents of Concern Carcinogenic and Noncarcinogenic Risk-based Concentrations for Soil, in accordance with this section
- [2] Identify the carcinogenic and noncarcinogenic RBCs for each organic compound and metal on Form FO 29E in Appendix 6, Table 6-3

94-DMR-001741

7.10 Performing Inclusive Risk Analysis (continued)

- [A] In those cases in which a constituent cannot be located on either the IDM RCRA Constituent of Concern List or the IDM Constituent of Concern List (both in Appendix 6), ERPD Risk Management personnel will evaluate whether an RBC should be calculated for that constituent

ERPD Risk Management Personnel (continued)

- [3] **IF** a constituent has a carcinogenic RBC,
THEN:

- [A] Divide Column 2 by the appropriate RBC for each constituent on Form FO 29E
- [B] Record the decimal fraction (ratio) on Form FO 29E, Column 8, for each constituent
- [C] Sum all of the ratios on Form FO 29E, Column 8, and record the sum in the *TOTAL* block at the bottom of the column
- [D] **IF** multiple pages for Form FO 29E are required,
THEN use the *GRAND TOTAL* block to sum the *TOTAL* blocks for the analysis

- [4] **IF** a constituent has a noncarcinogenic RBC,
THEN:

- [A] Divide Column 2 by the appropriate RBC for each constituent on Form FO 29E
- [B] Record the decimal fraction (ratio) on Form FO 29E, Column 9, for each constituent
- [C] Sum all of the ratios on Form FO 29E, Column 9, and record the sum in the *TOTAL* block at the bottom of the column

94-DMP-001741

7.10 Performing Inclusive Risk Analysis (Form FO.29C) (continued)

ERPD Risk Management Personnel (continued)

[D] IF multiple pages for Form FO 29E are required,
THEN use the *GRAND TOTAL* block to sum the *TOTAL* blocks for the analysis

[5] IF the *TOTALS* (or *GRAND TOTALS*) on Form FO 29E for both Columns 6 and 7,
are less than or equal to 1,
THEN:

[A] Sign or initial Form FO 29E

[B] Forward Form FO 29E to the ERPD PM for approval

ERPD PM

[C] Review and sign or initial Form FO 29E

Any concerns or problems with Form FO 29E can be addressed with the ERPD
Risk Management Analyst responsible for that particular risk analysis before
the form is approved

[D] Go to Section 7 11

ERM Risk Management Personnel

[6] IF the *TOTAL* (or *GRAND TOTAL*) blocks on Form FO 29E for either Columns 6 or
7, is greater than 1,
THEN:

[A] Sign or initial Form FO 29E

[B] Forward Form FO 29E to the ERPD PM for approval

94-AMP-001741

7.10 Performing Inclusive Risk Analysis (continued)

ERPD PM

[C] Review and sign or initial Form FO 29E

Any concerns or problems with Form FO 29E can be addressed with the ERPD Risk Management Analyst responsible for that particular risk analysis before the form is approved

[E] Go to Section 7 11

7.11 Managing IDM

NOTE *An independent radiological evaluation is still required but will be addressed at a later date*

ERPD EOM

[1] IF all of the following conditions exist

- Both the *TOTAL* (or *GRAND TOTAL*) block on Form FO 29E, Columns 6, 7, 8 and 9, are less than or equal to 1,
- The block is checked on Form FO 29E that states *TCLP regulatory level not exceeded (perform RCRA risk analysis)*,
- The block is not checked on Form FO 29E that states *Corrosive, ignitable, or reactive (RCRA hazardous waste)*,
THEN:

[A] Transfer the drummed IDM out of the RCRA 90-day storage area

[B] Manage the IDM in accordance with 4-F99-ENV-OPS-FO 23

ERPD PM

[2] IF *Yes* is recorded on Form FO 29E, Column 4, for any analyte,
OR the *TOTAL* (or *GRAND TOTAL*) blocks on Form FO 29E, in either Columns 6 or 7, are greater than 1,
OR the IDM contains constituents that exhibit RCRA characteristics of Ignitability, Reactivity, or Corrosivity as determined in Section 7 2 2,
THEN:

94-DMR-001741

7.11 Managing IDM (continued)

ERPD PM (continued)

- [A] Assign a waste code in accordance with the Hazardous Waste Requirements Manual (Manual 1-10000-HWR), Section 3 0, Waste Identification and Analysis
- [B] If waste is not contained, place it in containers in accordance with SOP FO 8, Handling of Drilling Fluids and Cuttings, and SOP FO 10, Receiving, Labelling, and Handling Environmental Material Containers
- [C] Complete labels for drums in accordance with the Waste Requirements Manual (Manual 1-1000-WRM) Procedure for Non-radioactive Waste Packaging (WP-1027)
- [D] Complete travelers for drums in accordance with the Waste Requirements Procedures Manual (Manual 5-2300-WRP) Procedure on Waste/Residue Traveler Instructions (WO-1102)

ERPD EOM

- [E] Transfer the drums containing RCRA waste to Waste Operations for proper storage in permitted or interim-status facilities in accordance with 4-F99-ENV-OPS-FO 23

ERPD PM

- [3] IF the *TOTAL* (or *GRAND TOTAL*) blocks on Form FO 29E, in either Columns 8 or 9, are greater than 1,
THEN:

- [A] If waste is not contained, place it in containers in accordance with SOP FO 8, Handling of Drilling Fluids and Cuttings, and SOP FO 10, Receiving, Labelling, and Handling Environmental Material Containers
- [B] Complete a label for the drum, identifying the IDM as containing CERCLA hazardous substances with risks greater than 1×10^{-6} with the disposition pending the ROD

ERPD EOM

- [C] Transfer the drums containing waste out of the 90-day storage area to an area to be determined for interim storage as non-RCRA waste

The disposition of the non-RCRA IDM in interim storage will be determined by parties to the Interagency Agreement (IAG) and the public as part of the ROD for the area in which the IDM were generated

8. **RECORDS**

Management of all records is consistent with 1-77000-RM-001, Records Management Guidance for Records Sources

The records generated as a result of this procedure are considered quality records and are managed in accordance with 2-G18-ER-ADM-17 01. The records generated as a result of this procedure are also considered potential Administrative Records and are managed in accordance with 3-21000-ADM-17 02, Administrative Records Screening and Processing, in addition to 2-G18-ER-ADM-17 01.

There are no nonquality records generated by this procedure.

ERPD PM

- [1] Ensure that the original and one copy of the following quality-related records, are transmitted to the ERPD PFC in accordance with 2-G18-ER-ADM-17 01:
- Form FO 29D
 - Form FO 29E

Submission of record copies to the ERPD PFC will satisfy Administrative Record requirements.

- [2] Ensure that one copy of the following quality-related records, is retained for the project file:
- Form FO 29D
 - Form FO 29E

94-DMR-001741

74-DMR-001744

8. **RECORDS (continued)**

ERPD PM (continued)

- [3] Ensure that one copy of the following quality-related records, is transmitted to ERPD EOM
- Form FO 29D
 - Form FO 29E

9. **REFERENCES**

CDH Interim Final Policy and Guidance on Risk Assessments for Corrective Action at RCRA Facilities, 11/93

Clement Associates, Comparative Potency Approach for Estimating the Cancer Risk Associated with Exposure to Mixtures of Polycyclic Aromatic Hydrocarbons, 1988

DOE, Background Geochemical Characterization Report, 09/93

DOE/CH/8901, A Manual for Implementing Residual Radioactive Material Guidelines, Argonne National Laboratory, 06/89

EPA, Health Effects Assessment Summary Tables (HEAST), 1993 (or current edition)

EPA, Human Health Evaluation Manual, Supplemental Guidance, Standard Default Exposure Factors, OSWER Directive 9285 6-03, 1991

EPA, Integrated Risk Information System (IRIS), 1994

EPA, New Interim Region IV Guidance (on Risk Assessment), 02/92

EPA, Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons, EPA/600/R-93/089, 07/93

EPA, Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual, 1989

9. REFERENCES (continued)

1-10000-HWR, Hazardous Waste Requirements Manual, Section 3 0, Waste Identification and Analysis

1-10000-WRM, Waste Requirements Manual, WP-1027, Non-radioactive Waste Packaging

1-77000-RM-001, Records Management Guidance for Records Source

2-G18-ER-ADM-17 01, Quality Assurance Records Management (Until issued, use
3-21000-ADM-17 01, Quality Assurance Records Management)

3-21000-ADM-17 02, Administrative Records Screening and Processing

4-F99-ENV-OPS-FO 23, Management of Soil and Sediment Investigation-derived Materials

5-23000-WRP, Waste Requirements Procedures Manual, WO-1102, Waste/Residue Traveler Instructions

5-21000-OPS-FO 20, Sampling Liquids and Solids from Environmental Materials Containers (when issued)

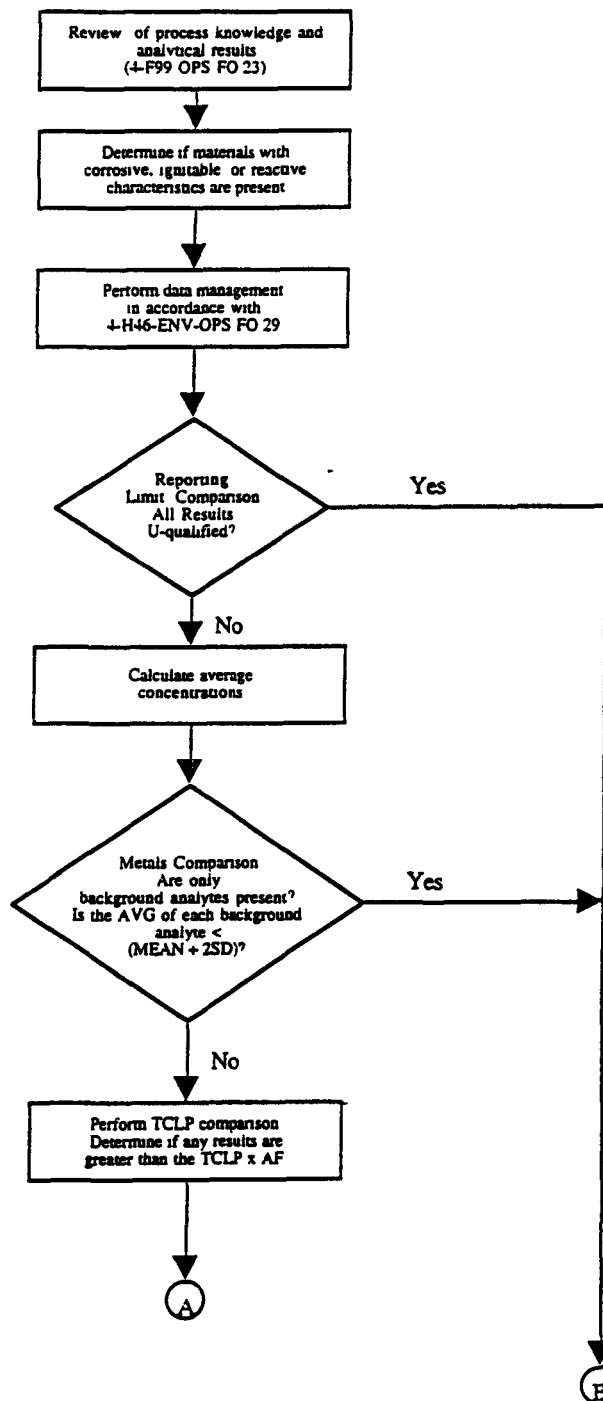
6 CCR 1007-3 Part 261, Identification and Listing of Hazardous Waste, 06/93

94-DMR-001741

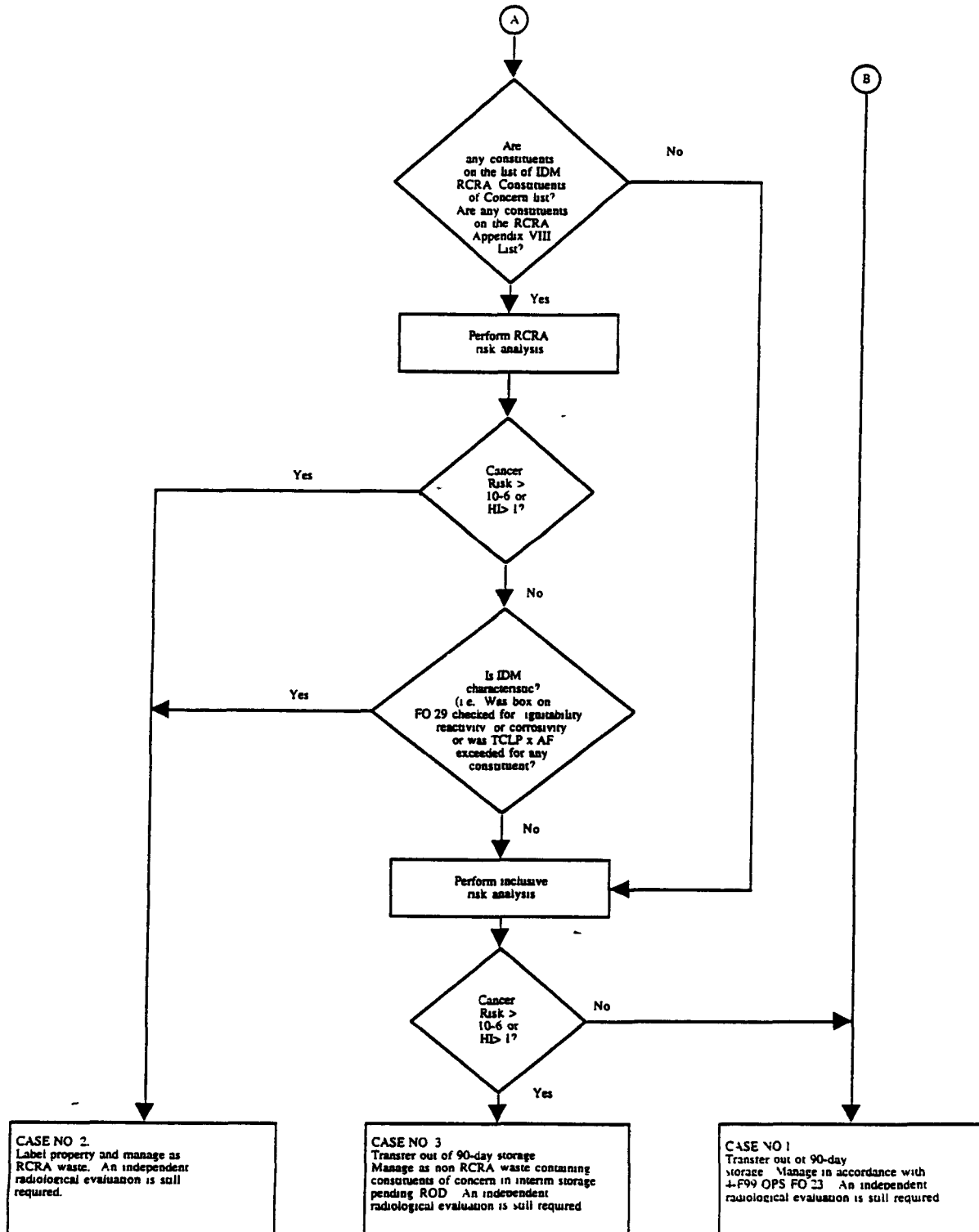
APPENDIX 1

Page 1 of 2

IDM EVALUATION FLOW CHART



APPENDIX 1
Page 2 of 2



APPENDIX 2

Page 1 of 1

FORM FO 29D

Page 1 of

DISPOSITION OF SOIL AND SEDIMENT IDM ADEQUACY DETERMINATION FORM

DRUM NO _____

BORING LOCATION _____

IHSS LOCATION _____

**Associated
Sample Nos.**

**Analytical
Method Name**

**Associated
Sample Nos.**

**Analytical
Method Name**

Is the following analytical information available for this drug?

VOAs	Y_	N_
------	----	----

If no, why?

Can another sample be used to characterize this drum?

If yes, sample ~~no~~ must be provided

SVOAs	Y_	N_
-------	----	----

If no, why?

Can another sample be used to characterize this drum?

If yes, sample no and rationale must be provided

Pest/ PCBs	Y_	N_
---------------	----	----

If no, why?

Can another sample be used to characterize this drum?

If yes, sample no and rationale must be provided

Metals Y_ N_

If no, why? _____

Can another sample be used to characterize this drum?

If yes, sample no and rationale must be provided

Rads **Y_** **N_**

If no, why? _____

Can another sample be used to characterize this drum?

If yes, sample no and rationale must be provided

Additional Comments

ERP Project Manager

The analytical information described on this form is based on information from potentially unvalidated data from RFEDs. The criteria used to make the determination of whether the data consist of appropriate and adequate analytical information to perform a waste characterization evaluation is established in 4-H46-ENV-OPS-FO 29. A subcontractor was used in support of completing this form and their work has not been independently verified by the PM. Based on the above, this form is accurate to the best of the PM's knowledge and belief.

APPENDIX 3
Page 1 of 6

IDM RCRA CONSTITUENTS OF CONCERN

Common Name	Chemical Abstracts Name	Other Synonyms	CAS No
Acetone	2-Propanone		67-64-1
Acetonitrile	Same		75-05-8
Acetophenone	Ethanone, 1-phenyl-		98-86-2
2-Acetylaminefluorone	Acetamide, N-9H-fluoren-2-yl-		53-96-3
Acrolein	2-Propenal		107-02-8
Acrylonitrile	2-Propenenitrile		107-13-1
Aldrin	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10 10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5alpha,8alpha, 8abeta)-		309-00-2
Allyl chloride	1-Propane, 3-chloro	3-Chloropropene	107-18-6
4-Aminobiphenyl	[1,1'-Biphenyl]-4-amine		92-67-1
Aniline	Benzenamine		62-53-3
Antimony	Same		7440-36-0
Aramite	Sulfurous acid, 2-chloroethyl 2-[4-(1,1- dimethylethyl)phenoxy]-1-methylethyl ester		140-57-8
Arsenic	Same		7440-38-2
Barium	Same		7440-39-3
Benzo[a]anthracene	Same		56-55-3
Benzene	Same		71-43-2
Benzidine	[1,1'-Biphenyl]-4,4'-diamine		92-87-5
Benzo[b]fluoranthene	Benz[e]acephenanthrylene		205-99-2
Benzo[k]fluoranthene	Same		207-08-9
Benzo[a]pyrene	Same		50-32-8
Beryllium	Same		7440-41-7
Bromoform	Methane, tribromo-		75-25-2
4-Bromophenyl phenyl ether	Benzene, 1-bromo-4-phenoxy-	p-Bromodiphenyl ether	101-55-3
Butyl benzyl phthalate	1,2-Benzenedicarboxylic acid, butyl phenylmethyl ester		85-68-7
Cadmium	Same		7440-43-9
Carbon disulfide	Same		75-15-0
Carbon tetrachloride	Methane, tetrachloro-		56-23-5
Chlordane	4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8- octachloro-2,3,3a,4,7,7a-hexahydro-		57-74-9
Chlordane (alpha and gamma isomers)		Alpha-Chlordane Gamma-Chlordane	5103-71-9 5103-74-2
p-Chloroaniline	Benzenamine, 4-chloro-	4-Chloroaniline	106-47-8
Chlorobenzene	Benzene, chloro-		108-90-7
Chlorobenzilate	Benzenecetic acid, 4-chloro-alpha-(4-chlorophenyl)-		510-15-6
p-Chloro-m-cresol	Phenol, 4-chloro-3-methyl-	4-Chloro-3-methylphenol	59-50-7
2-Chloroethyl vinyl ether	Ethene, (2-chloroethoxy)-		110(-7)5-8
Chloroethane			75-00-3
Chloroform	Methane, trichloro-		67-66-3
beta-Chloronaphthalene	Naphthalene, 2-chloro-	2-Chloronaphthalene	91-58-7
o-Chlorophenol	Phenol 2-chloro-	2-Chlorophenol	95-57-8
Chloroprene	1,3-Butadiene 2-chloro-	2-Chloro-1,3-Butadiene	126-99-8

APPENDIX 3
Page 2 of 6

Common Name	Chemical Abstracts Name	Other Synonyms	CAS No
Chromium	Same		7440-47-3
Chromium (III)			16065-83-1
Chromium (VI)			18540-29-9
Chrysene	Same		218-01-9
m-Cresol	Phenol, 3-methyl	3-Methylphenol	108-39-4
o-Cresol	Phenol, 2-methyl	2-Methylphenol	95-48-7
p-Cresol	Phenol 4-methyl	4-Methylphenol	106-44-5
Cyanide			57-12-5
2,4-D	Acetic acid, (2,4-dichlorophenoxy)-	2,4-Dichlorophenoxy- acetic acid, salts and esters	94-75-7
DDD	Benzene, 1,1'-(2,2-dichloroethylidene)bis[4 chloro-	2,4'-DDD 4,4'-DDD	72-54-8
DDE	Benzene, 1,1'-(dichloroethenylidene)bis[4- chloro-	2,4'-DDE 4,4'-DDE	72-55-9
DDT	Benzene, 1,1'-(2,2,2- trichloroethylidene)bis[4-chloro-	O,P'-DDT 4,4'-DDT	50-29-3
Diallate	Carbamothioic acid, bis(1-methylethyl)-, S- (2,3-dichloro-2-propenyl) ester		2303-16-4
Dibenzo[a,h]anthracene	Same		53-70-3
1,2-Dibromo-3-chloropropane	Propane, 1,2-dibromo-3-chloro-		96-12-8
Dibutyl phthalate	1,2-Benzenedicarboxylic acid, dibutyl ester	Di-n-butyl phthalate	84-74-2
o-Dichlorobenzene	Benzene, 1,2-dichloro-	1,2-Dichlorobenzene	95-50-1
m-Dichlorobenzene	Benzene, 1,3-dichloro-	1,3-Dichlorobenzene	541-73-1
p-Dichlorobenzene	Benzene, 1,4-dichloro-	1,4-Dichlorobenzene	106-46-7
3,3'-Dichlorobenzidine	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro		91-94-1
1,4-Dichloro-2-butene	2-Butene 1,4-dichloro-		764-41-0
trans-1,4-Dichloro-2-butene			110-57-6
Dichlorodifluoromethane	Methane dichlorodifluoro-		75-71-8
1,1-Dichloroethene	Ethene, 1,1-dichloro-		75-35-4
1,2-Dichloroethene	Ethene, 1,2-dichloro-		156-60-5
cis-1,2-Dichloroethene			
trans-1,2-Dichloroethene			
Dichloroethyl ether	Ethane, 1,1'-oxybis[2-chloro-	Bis(2-chloroethyl) ether	111-44-4
Dichloroisopropyl ether	Propane, 2,2'-oxybis[2-chloro-	Bis(2-chloroisopropyl) ether	108-60-1
Dichloromethoxy ethane	Ethane, 1,1'-[methylenbis(oxy)]bis[2-	Bis(2-chloroethoxy) methane	111-91-1
2,4-Dichlorophenol	Phenol 2,4-dichloro-		120-83-2
2,6-Dichlorophenol	Phenol 2,6-dichloro-		87-65-0
1,3-Dichloropropene	1-Propene 1,3-dichloro-		542-75-6
cis-1,3-Dichloropropene			10061-01-5
trans-1,3-Dichloropropene			10061-02-06

APPENDIX 3
Page 3 of 6

Common Name	Chemical Abstracts Name	Other Synonyms	CAS No
Dieldrin	2,7,3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a octahydro-, (1aalpha,2beta,2aalpha,3beta,6beta, 6aalpha,7beta,7aalpha)-		60-57-1
1,4-Diethyleneoxide	1,4-Dioxane		123-91-1
Diethylhexyl phthalate	1,2-Benzenedicarboxylic acid, bis(2-	Bis(2-ethylhexyl) phthalate	117-81-7
Diethyl phthalate	1,2-Benzenedicarboxylic acid, diethyl ester		84-66-2
o,o-Diethyl o-pyrazinyl phosphoro-thioate	Phosphorothioic acid, O,O-diethyl O- pyrazinyl ester	Thionazin	297-97-2
Dumethoate	Phosphorodithioic acid, O,O-dimethyl S-[2- (methylamino)-2-oxoethyl] ester		60-51-5
p-Dimethylaminoazobenzene	Benzenamine, N,N-dimethyl-4-(phenylazo)-		60-11-7
7,12-Dimethylbenz[a]anthracene	Benz[a]anthracene, 7,12-dimethyl-		57-97-6
3,3'-Dimethylbenzidine	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl	o-Tolidine	119-93-7
alpha, alpha-Dimethylphenethylamine	Benzenethanamine, alpha, alpha-dimethyl-		122-09-8
2,4-Dimethylphenol	Phenol, 2,4-dimethyl-		105-67-9
Dimethyl phthalate	1,2 Benzenedicarboxylic acid, dimethyl		131-11-3
1,3-Dinitrobenzene	Benzene, dinitro-		25154-54-5
4,6-Dinitro-o-cresol	Phenol, 2-methyl-4,6-dinitro-	4,6-Dinitro-2-methylphenol	534-52-1
2,4-Dinitrophenol	Phenol, 2,4-dinitro-		51-28-5
2,4-Dinitrotoluene	Benzene, 1-methyl-2,4-dinitro-	1-Methyl-2,4-dinitrobenzene	121-14-2
2,6-Dinitrotoluene	Benzene, 2-methyl-1,3-dinitro-		606-20-2
Dinoseb	Phenol, 2-(1-methylpropyl)-4,6-dinitro-		88-85-7
Di-n-octyl phthalate	1,2-Benzenedicarboxylic acid, dioctyl ester		117-84-0
Diphenylamine	Benzenamine, N-phenyl-		122-39-4
Disulfoton	Phosphorodithioic acid, O,O-diethyl S-[2-		298-04-4
Endosulfan	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a- hexahydro- 3-oxide	Endosulfan I Endosulfan II	115-29-7
Endrin	2,7,3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a octa-hydro-, (1aalpha,2beta,2beta,3alpha,6alpha, 6alpha,7beta,7aalpha)-		72-20-8
Endrin metabolites		Endrin aldehyde	
		Endrin ketone	
Ethyl cyanide	Propanenitrile		107-12-0
Ethylene dibromide	Ethane, 1,2-dibromo-	1,2-Dibromoethane	106-93-4
Ethylene dichloride	Ethane, 1,2-dichloro-	1,2-Dichloroethane	107-06-2
Ethylidene dichloride	Ethane, 1,1-dichloro-	1,1-Dichloroethane	75-34-3
Ethyl methacrylate	2-Propenoic acid, 2-methyl-, ethyl ester		97-63-2
Ethyl methanesulfonate	Methanesulfonic acid, ethyl ester		62-50-0

APPENDIX 3

Page 4 of 6

Common Name	Chemical Abstracts Name	Other Synonyms	CAS No
Famphur	Phosphorothioic acid, O-[4- [(dimethylamino)sulfonyl]phenyl] O,O- dimethyl ester		52-85-7
Fluoranthene	Same		206-44-0
Heptachlor	4,7-Methano-1H-indene, 1,4,5,6,7,8,8- heptachloro-3a,4,7,7a-tetrahydro-		76-44-8
Heptachlor epoxide	2,5-Methano-2H-indeno[1,2-b]oxirene, 2,3,4,5,6,7,7-heptachloro-1a,1b,5,5a,6,6a- hexa-hydro-, (1aalpha,1bbeta,2alpha,5alpha, 5abeta,6beta,6aalpha)-		1024-57-3
Heptachlor epoxide (alpha, beta, and gamma)		Heptachlor Epoxide a Heptachlor Epoxide b	
Hexachlorobenzene	Benzene, hexachloro-		118-74-1
Hexachlorobutadiene	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-		87-68-3
Hexachlorocyclopentadiene	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro		77-47-4
Hexachloroethane	Ethane, hexachloro-		67-72-1
Hexachlorophene	Phenol, 2,2'-methylenebis[3,4,6-trichloro-		70-30-4
Hexachloropropene	1-Propene, 1,1,2,3,3,3-hexachloro-		1888-71-7
Indeno[1,2,3-cd]pyrene	Same		193-39-5
Isobutyl alcohol	1-Propanol, 2-methyl-		78-83-1
Isodrin	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10 hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5beta,8beta,8abeta)-	1,2,3,4,10,10-Hexachloro- 1,4,4a,5,8,8a-hexahydro- 1,4,5,8-Dimethanonaphthalene	465-73-6
Isosafrole	1,3-Benzodioxole, 5-(1-propenyl)-		120-58-1
Kepone	1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2- one, 1,1a,3,3a,4,5,5a,5b,6- decachlorooctahydro-		143-50-0
Lead	Same		7439-92-1
Lindane	Cyclohexane 1,2,3,4,5,6-hexachloro-,	Gamma-BHC	58-89-9
Mercury	Same		7439-97-6
Methacrylonitrile	2-Propenenitrile, 2-methyl-		126-98-7
Methapyrilene	1,2-Ethanediamine, N,N-dimethyl-N'-2- pyridinyl-N'-(2-thienylmethyl)-		91-80-5
Methoxychlor	Benzene, 1,1'-(2,2,2- trichloroethylidene)bis[4-methoxy-		72-43-5
Methyl bromide	Methane, bromo-	Bromomethane	74-83-9
Methyl chloride	Methane, chloro-	Chloromethane	74-87-3
Methyl chloroform	Ethane, 1,1,1-trichloro-	1,1,1-Trichloroethane	71-55-6
3-Methyl cholanthrene	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-		56-49-5
Methyl ethyl ketone	2-Butanone		78-93-3
Methyl iodide	Methane iodo-	Iodomethane	74-88-4
Methyl methacrylate	2-Propenoic acid, 2-methyl-, methyl ester		80-62-6
Methyl methane sulfonate	Methanesulfonic acid, methyl ester	Methyl methanesulfonate	66-27-3

APPENDIX 3

Page 5 of 6

Common Name	Chemical Abstracts Name	Other Synonyms	CAS No
Methyl parathion	Phosphorothioic acid, O,O-dimethyl O-(nitro-phenyl) ester	Parathion, methyl	298-00-0
4-Methyl-2-pentanone	Methyl isobutyl ketone		108-10-1
Methylene bromide	Methane dibromo-	Dibromomethane	74-95-3
Methylene chloride	Methane, dichloro-		75-09-2
Naphthalene	Same		91-20-3
1,4-Naphthoquinone	1,4-Naphthalenedione		130-15-4
alpha-Naphthylamine	1-Naphthalenamine	1-Naphthylamine	134-32-7
beta-Naphthylamine	2-Naphthalenamine		91-59-8
Nickel	Same		7440-02-0
Nickel carbonyl	Nickel carbonyl Ni(CO) ₄ (T-4)-		13463-39-3
Nickel cyanide	Nickel cyanide Ni(CN) ₂		557-19-7
p-Nitroaniline	Benzenamine, 4-nitro-	4-Nitroaniline	100-01-6
Nitrobenzene	Benzene, nitro-		98-95-3
p-Nitrophenol	Phenol 4-nitro-	4-Nitrophenol	100-02-7
N-Nitroso-di-n-propylamine			621-64-7
N-Nitroso-di-n-butylamine	1-Butanamine N-butyl-N nitroso-	N-Nitrosodibutylamine	924-16-3
N-Nitrosodiethylamine	Ethanamine, N-ethyl-N-nitroso-		55-18-5
N-Nitrosodimethylamine	Methanamine N-methyl-N-nitroso-		62-75-9
N-Nitrosomethylethylamine	Ethanamine, N-methyl-Nnitroso-		10595-95-6
N-Nitrosomorpholine	Morpholine, 4-nitroso-		59-89-2
N-Nitrosopiperidine	Piperidine, 1-nitroso		100-75-4
N-Nitrosopyrrolidine	Pyrrolidine, 1-nitroso-		930-55-2
5-Nitro-o-toluidine	Benzenamine 2-methyl-5-nitro-		99-55-8
Pentachlorobenzene	Benzene, pentachloro-		608-93-5
Pentachloroethane	Ethane, pentachloro-		76-01-7
Pentachloronitrobenzene	Benzene, pentachloronitro-		82-68-8
Pentachlorophenol	Phenol, pentachloro-		87-86-5
Phenacetin	Acetamide, N-(4-ethoxyphenyl)-		62-44-2
Phenol	Same		108-95-2
Phorate	Phosphorodithioic acid, O,O-diethyl S-[(ethyl-thio)methyl] ester		298-02-2
2-Picoline	Pyridine, 2-methyl-	2-methyl-pyridine	109-06-8
Polychlorinated biphenyls			
Aroclor-1016			12674-11-2
Aroclor-1221			11104-28-2
Aroclor-1232			11141-16-5
Aroclor-1242			53469-21-9
Aroclor-1248			12672-29-6
Aroclor-1254			11097-69-1
Aroclor-1260			11096-82-5
Pronamide	Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-		23950-58-5
Propylene dichloride	Propane, 1,2-dichloro	1,2-Dichloropropane	78-87-5
Pyridine	Same		110-86-1
Safrole	1,3-Benzodioxole 5-(2-propenyl)-		94-59-7
Selenium	Same		7782-49-2

APPENDIX 3
Page 6 of 6

Common Name	Chemical Abstracts Name	Other Synonyms	CAS No
Silver	Same		7440-22-4
1,2,4,5-Tetrachlorobenzene	Benzene, 1,2,4,5-tetrachloro-		95-94-3
1,1,1,2-Tetrachloroethane	Ethane, 1,1,1,2-tetrachloro-		630-20-6
1,1,2,2-Tetrachloroethane	Ethane, 1,1,2,2-tetrachloro-		79-34-5
Tetrachloroethene	Ethene, tetrachloro-		127-18-4
2,3,4,6-Tetrachlorophenol	Phenol, 2,3,4,5-tetrachloro-		58-90-2
Tetraethyldithiopyrophosphate	Thiodiphosphoric acid, tetraethyl ester	Sulfotep	3689-24-5
Tetraethylpyrophosphate	Diphosphoric acid, tetraethyl ester	Tetraethyl pyrophosphate	107-49-3
Thallic oxide	Thallium oxide Tl_2O_3		1314-32-5
Thallium acetate	Acetic acid, thallium (1+) salt		563-68-8
Thallium carbonate	Carbonic acid, dithallium (1+) salt		6533-73-9
Thallium chloride	Thallium chloride $TlCl$		7791-12-0
Thallium nitrate	Nitric acid, thallium (1+) salt		10102-45-1
Thallium selenite	Selenious acid, dithallium (1+) salt		12039-52-0
Thallium (I) sulfate	Sulfuric acid, dithallium (1+) salt		7446-18-6
Toluene	Benzene, methyl-		108-88-3
o-Toluidine			95-53-4
p-Toluidine	Benzenamine, 4-methyl-		106-49-0
Toxaphene	Same		8001-35-2
1,2,4-Trichlorobenzene	Benzene, 1,2,4-trichloro-		120-82-1
1,1,2-Trichloroethane	Ethane, 1,1,2-trichloro-		79-00-5
Trichloroethene	Ethene, trichloro-		79-01-6
Trichlorofluoromethane	Methane, trichlorofluoro-		75-69-4
2,4,5-Trichlorophenol	Phenol, 2,4,5-trichloro-		95-95-4
2,4,6-Trichlorophenol	Phenol, 2,4,6-trichloro-		88-06-2
O,O,O-Triethyl phosphorothioate	Phosphorothioic acid, O,O,O-triethyl ester		126-68-1
2,4,5-Trichlorophenoxyacetic acid	Acetic acid, (2,4,5-trichlorophenoxy)-		93-76-5
2,4,5-Trichlorophenoxypropanoic acid	Propanoic acid, 2-(2,4,5-trichlorophenoxy)-		93-72-1
1,3,5-Trinitrobenzene	Benzene, 1,3,5-trinitro-		99-35-4
m-Xylene	m-Benzene dimethyl		108-38-3
o-Xylene	o-Benzene, dimethyl		95-47-6
p-Xylene	p-Benzene, dimethyl		106-42-3
Total Xylene (mixed isomers)	Benzene, dimethyl		1330-20-7
Vinyl chloride	Ethene chloro-		75-01-4

94-dm2-001741

APPENDIX 4

Page 1 of 11

TCLP REGULATORY LEVELS AND TABLE OF RISK-BASED CONCENTRATIONS

TABLE 6-1

TCLP CONSTITUENTS OF CONCERN MAXIMUM CONTAMINATION LEVELS

CHEMICAL	REGULATORY LEVEL
Arsenic	50
Barium	1000
Benzene	0.5
Cadmium	10
Carbon tetrachloride	0.5
Chlordane	0.03
Chlorobenzene	1000
Chloroform	60
Chromium	50
o-Cresol	2000 ^a
m-Cresol	2000 ^a
p-Cresol	2000 ^a
Cresol	2000 ^a
2,4-D	100
1,4-Dichlorobenzene	75
1,2-Dichloroethane	0.5
1,1,-Dichloroethylene	0.7
2,4-Dinitrotoluene	0.13 ^b
Endrin	0.02
Heptachlor (and its hydroxide)	0.008
Hexachlorobenzene	0.13 ^b
Hexachlorobutadiene	0.5
Hexachloroethane	30
Lead	50
Lindane	0.4
Mercury	0.2
Methoxychlor	100
Methyl ethylketone	2000
Nitrobenzene	20
Pentachlorophenol	1000
Pyridine	50 ^b
Selenium	10
Silver	50
Tetrachloroethylene	0.7
Toxaphene	0.5
Trichloroethylene	0.5
2,4,5-Trichlorophenol	4000
2,4,6-Trichlorophenol	20
2,4,5-TP (Silvex)	10
Vinyl chloride	0.2

^a If o-, m-, and p-Cresol concentrations cannot be differentiated the total cresol (DO26) concentration is used. The regulatory level of total cresol is 200 mg/l

^b Quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level

Page 2 of 11

TABLE 6-2

[illegible]

APPENDIX 4

Page 3 of 11

TABLE 6-2 (continued)

Common Name	References	Oral Unit Risk 1/(mg/L)	Oral Slope Factor 1/(mg/kg-day)	Inhalation Unit Risk 1/(µg/m³)	Inhalation Slope Factor 1/(mg/kg-day)	Oral RfD (mg/kg-day)	Inhalation RfC (mg/m³)	Inhalation RfD (mg/kg-day)	RBCc (mg/kg)	RBCnc (mg/kg)
2-Chloroethyl vinyl ether	1	-	-	-	-	-	1.0E-01	2.9E+00	NA	NA
Chloroethane	1	-	-	-	-	-	-	-	NA	NA
Chloroform	1	-	6.1E-03	2.3E-05	8.1E-02	1.0E-02	-	-	3.357334191	139.4700139
beta-Chloronaphthalene	1	-	-	-	-	8.0E-02	-	-	NA	1115.760112
o-Chlorophenol	1	-	-	-	-	5.0E-03	-	-	NA	69.73500697
Chloroprene	2	-	-	-	-	-	7.0E-03	2.0E-03	NA	NA
Chromium	1	-	-	-	-	-	-	-	NA	NA
Chromium (III)	1	-	-	-	-	1.0E+00	-	-	NA	12626.26263
Chromium (VI)	1	-	-	1.2E-02	4.2E-01	5.0E-03	-	-	580.7200929	63.13131313
Chrysene	3	-	7.3E-03	-	-	-	-	-	85.61643836	NA
m-Cresol	1	-	-	-	-	5.0E-02	-	-	NA	697.3500697
o-Cresol	1	-	-	-	-	5.0E-02	-	-	NA	697.3500697
p-Cresol	2	-	-	-	-	5.0E-03	-	-	NA	69.73500697
Cyanide	1	-	-	-	-	2.0E-02	-	-	NA	278.9400279
2,4-D	1	-	-	-	-	1.0E-02	-	-	NA	139.4700139
DDD	1	-	2.4E-01	-	-	-	-	-	0.136165577	NA
DDE	1	-	3.4E-01	-	-	-	-	-	0.096116878	NA
DDT	1	-	3.4E-01	9.7E-05	3.4E-01	5.0E-04	-	-	0.096116878	6.973500697
Diallate	2	1.7E-06	6.1E-02	-	-	-	-	-	0.335733419	NA
Dibenz(a,b)anthracene	3	-	7.3E-00	-	-	-	-	-	0.085616438	NA
1,2-Dibromo-3-chloropropane	1,2	4.0E-05	1.4E-00	2.4E-03	6.9E-01	2.0E-02	2.0E-04	5.7E-05	0.02334267	NA
Dibromochloromethane	1	-	8.40E-02	-	-	-	-	-	0.389044507	278.9400279
Dibutyl phthalate	1	-	-	-	-	1.0E-01	-	-	NA	1394.700139
o-Dichlorobenzene	1,2	-	-	-	-	9.0E-02	2.0E-01	5.7E-02	NA	1255.230126
m-Dichlorobenzene	1	-	-	-	-	1.0E-04	-	-	NA	1.394700139
p-Dichlorobenzene	1,2	6.8E-07	2.4E-02	-	-	-	8.0E-01	2.3E-01	1.361655773	NA
3,3-Dichlorobenzidine	1	-	4.5E-01	-	-	-	-	-	0.072621641	NA
1,4-Dichloro-2-butene	2	-	-	2.6E-03	9.3E+00	-	-	-	NA	NA
trans-1,4-Dichloro-2-butene	2	-	-	2.6E-03	9.3E+00	-	-	-	NA	NA
Dichlorodifluoromethane	1	-	-	-	-	-	-	-	NA	2789.400279
1,1-Dichloroethene	1	-	6.0E-01	5.0E-05	1.8E-01	9.0E-03	-	-	0.054466231	125.5230126
1,2-Dichloroethane	1	-	-	-	-	1.0E-02	-	-	NA	278.9400279
cis-1,2-Dichloroethane	2	-	-	-	-	1.0E-02	-	-	NA	139.4700139
trans-1,2-Dichloroethane	1	-	-	-	-	2.0E-02	-	-	NA	278.9400279

94-DMR-001741

5/12/94

94-DME-001744

APPENDIX 4

Page 4 of 11

TABLE 6-2 (continued)

Common Name	References	Oral Unit Risk 1/(mg/L)	Oral Slope Factor 1/(mg/kg-day)	Inhalation Unit Risk 1/(µg/m ³)	Inhalation Slope Factor 1/(mg/kg-day)	Oral RfD (mg/kg-day)	Inhalation RfC (mg/m ³)	Inhalation RID (mg/kg-day)	RBCc (mg/kg)	RBCnc (mg/kg)
Dichloroethyl ether	1	-	1E-00	3E-04	1E-00	-	-	-	0.02970853	NA
Dichloropropyl ether	1,2	2E-06	7E-02	1E-05	3E-02	-	-	-	0.46683408	NA
Dichloromethoxy ethane	1	-	-	-	-	-	-	-	NA	NA
2,4-Dichlorophenol	1	-	-	-	-	3E-03	-	-	NA	41.84100418
2,6-Dichlorophenol	1	-	-	-	-	-	-	-	NA	NA
1,3-Dichloropropene	1,2	5E-06	1E-01	3E-05	1E-01	3E-04	2E-02	5E-03	0.181554103	4.184100418
cis-1,3-Dichloropropene	1,2	5E-06	1E-01	3E-05	1E-01	3E-04	2E-02	5E-03	0.181554103	4.184100418
trans-1,3-Dichloropropene	1,2	5E-06	1E-01	3E-05	1E-01	3E-04	2E-02	5E-03	0.181554103	4.184100418
Dieldrin	1	-	1E-01	4E-03	1E-01	5E-05	-	-	0.002042484	0.69735007
1,4-Diethylenedioxides	1	-	1E-02	-	-	-	-	-	2.970885324	NA
Diethylhexyl phthalate	1	-	1E-02	-	-	2E-02	-	-	2.33426704	278.9400279
Diethyl phthalate	1	-	-	-	-	8E-01	-	-	NA	11157.60112
o,o-Diethyl o-pyrazinyl phosphorothioate	1	-	-	-	-	-	-	-	NA	NA
Dimethoate	1	-	-	-	-	2E-04	-	-	NA	2.789400279
p-Dimethylaminoazobenzene	1	-	-	-	-	-	-	-	NA	NA
7,12-Dimethylbenz(a)anthracene	1	-	-	-	-	-	-	-	NA	NA
3,3-Dimethylbenzidine	1	-	-	-	-	-	-	-	NA	NA
alpha, alpha-Dimethylphenethylamine	1	-	-	-	-	-	-	-	NA	NA
2,4-Dimethylphenol	1	-	-	-	-	2E-02	-	-	NA	278.9400279
Dimethyl phthalate	2	-	-	-	-	1E-01	-	-	NA	139470.0139
1,3-Dinitrobenzene	1	-	-	-	-	1E-04	-	-	NA	1394700139
4,6-Dinitro-o-cresol	1	-	-	-	-	-	-	-	NA	NA
2,4-Dinitrophenol	1	-	-	-	-	2E-03	-	-	NA	27.89400279
2,4-Dinitrotoluene	1	-	-	-	-	2E-03	-	-	NA	27.89400279
2,6-Dinitrotoluene	2	-	-	-	-	1E-03	-	-	NA	13.94700139
Dinoseb	1	-	-	-	-	1E-03	-	-	NA	13.94700139
Di-n-octyl phthalate	2	-	-	-	-	2E-02	-	-	NA	278.9400279
Diphenylamine	1	-	-	-	-	2E-02	-	-	NA	278.9400279
Disulfoton	1	-	-	-	-	4E-05	-	-	NA	0.557880056
Endosulfan	2	-	-	-	-	6E-03	-	-	NA	83.68200837
Endrin	1	-	-	-	-	3E-04	-	-	NA	4.184100418
Endrin metabolites	1	-	-	-	-	-	-	-	NA	NA
Ethyl cyanide	1	-	-	-	-	-	-	-	NA	NA
Ethylene dibromide	1,2	-	8.5E+01	2.2E-04	7.7E-01	-	2E-04	5.7E-05	0.000384468	NA

Page 5 of 11

TABLE 6-2 (continued)

Common Name	References	Oral Unit Risk l/(mg/L)	Oral Slope Factor l/(mg/kg·day)	Inhalation Unit Risk l/(µg/m3)	Inhalation Slope Factor l/(mg/kg·day)	Oral RfD (mg/kg·day)	Inhalation RfC (mg/m3)	Inhalation RfD (mg/kg·day)	RBCc (mg/g)	RBCnc (mg/g)
ethylene dichloride	1	-	9.1E-02	2.6E-03	9.1E-02	-	5.0E-01	1.4E-01	0.359118006	NA
trichloroethylene	2	-	-	-	-	-	-	-	NA	1394.700139
vinyl methacrylate	2	-	-	-	-	9.0E-02	-	-	NA	1253.220126
ethyl methanesulfonate	-	-	-	-	-	-	-	-	NA	NA
amphur	-	-	-	-	-	-	-	-	NA	NA
fluoranthene	1	-	-	-	-	-	-	-	NA	557.800538
leptachlor	1	-	4.3E-00	1.3E-03	4.6E-00	5.0E-04	-	-	0.007262164	6.973500697
isopachlor epoxide	1	-	9.1E+00	2.6E-03	9.1E+00	1.3E-03	-	-	0.00339118	0.181311018
leptachlor epoxide (alpha, beta, and gamma)	1	-	9.1E+00	2.6E-03	9.1E+00	1.3E-03	-	-	0.00339118	0.181311018
leptachlorbenzene	1	-	1.6E+00	4.6E-04	1.6E+00	8.0E-04	-	-	0.020424837	1.15760112
leptachlorobutadiene	1,2	-	7.8E-02	2.2E-03	7.7E-02	2.0E-04	7.0E-05	2.0E-05	0.418971007	2.789400279
leptachlorocyclopentadiene	1,2	-	-	-	-	-	-	-	NA	97.62900976
leptachloroethane	1	-	1.4E-02	4.0E-06	1.4E-02	1.0E-03	-	-	2.33426704	13.94700139
leptachlorophene	1	-	-	-	-	3.0E-04	-	-	NA	4.184100418
leptachloropropene	1	-	-	-	-	-	-	-	NA	NA
indeno[1,2,3-cd]pyrene	3	-	7.3E-01	-	-	-	-	-	0.856164384	NA
isobutyl alcohol	1	-	-	-	-	3.0E-01	3.0E-01	8.6E-02	NA	4184.100418
sodium	1	-	-	-	-	-	-	-	NA	NA
isosafrole	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachloropropene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-	NA	NA
hexachlorocyclopentadiene	-	-	-	-	-	-	-	-	NA	NA
hexachlorobenzene	-	-	-	-	-	-	-	-</		

94-DMP-001741

DISPOSITION OF SOIL AND
SEDIMENT INVESTIGATION-
DERIVED MATERIALS

5/12/94

4-H46-ENV-OPS-FO 29
REVISION 0
PAGE 55 OF 67

APPENDIX 4

Page 6 of 11

TABLE 6-2 (continued)

Common Name	References	Oral Unit Risk 1/(mg/L)	Oral Slope Factor 1/(mg/kg-day)	Inhalation Unit Risk 1/(ug/m ³)	Inhalation Slope Factor 1/(mg/kg-day)	Oral RfD (mg/kg-day)	Inhalation RfC (mg/m ³)	Inhalation RfD (mg/kg-day)	RfC (mg/kg)	RfD (mg/kg)
1-Ethyl parathion	1	-	-	-	-	2.50E-04	-	-	NA	3.486750349
4-Methyl 2-pentanone	2	-	-	-	-	5.00E-02	-	-	NA	697.3500697
Methylene bromide	-	-	-	-	-	-	-	-	NA	NA
Methylene chloride	1,2	2.10E-07	7.50E-03	4.70E-07	1.64E-03	6.00E-02	3.0E-00	-	4.357298475	836.8200837
Naphthalene	-	-	-	-	-	-	-	-	NA	NA
1,4-Naphthoquinone	-	-	-	-	-	-	-	-	NA	NA
alpha-Naphthylamine	-	-	-	-	-	-	-	-	NA	NA
beta-Naphthylamine	-	-	-	-	-	-	-	-	NA	NA
Nickel	-	-	-	-	-	-	-	-	NA	NA
Nickel carbonyl	-	-	-	-	-	-	-	-	NA	NA
Nickel cyanide	-	-	-	-	-	-	-	-	NA	NA
p-Nitroaniline	-	-	-	-	-	-	-	-	NA	NA
Nitrobenzene	1	-	-	-	-	5.00E-04	-	-	NA	6.973500697
p-Nitrophenol	-	-	-	-	-	-	-	-	NA	NA
N-Nitroso-di-n-propylamine	-	-	7.00E-00	-	-	-	-	-	0.004668534	NA
N-Nitroso-di-n-butylamine	1	1.60E-04	5.40E+00	1.60E-03	5.59E+00	-	-	-	0.006051803	NA
N-Nitrosodimethylamine	1	1.430E-03	1.50E+02	4.30E-02	1.50E-02	-	-	-	0.000217865	NA
N-Nitrosodimethylamine	1	1.40E-03	5.10E+01	1.40E-02	4.90E-01	-	-	-	0.000640779	NA
N-Nitrosomethyl ethylamine	1	6.30E-04	2.20E+01	-	-	-	-	-	0.001485443	NA
N-Nitrosomorpholine	-	-	-	-	-	-	-	-	NA	NA
N-Nitrosopiperidine	-	-	-	-	-	-	-	-	NA	NA
N-Nitrosopyrrolidine	1	6.10E-03	2.10E+00	6.10E-04	2.13E+00	-	-	-	0.01556178	NA
5-Nitro-o-toluidine	-	-	-	-	-	-	-	-	NA	NA
Pentachlorobenzene	1	-	-	-	-	8.00E-04	-	-	NA	11.15760112
Pentachloroethane	-	-	-	-	-	-	-	-	NA	NA
Pentachloronitrobenzene	1,2	7.40E-06	2.60E+01	-	-	3.00E-03	-	-	0.125691302	41.84100418
Pentachlorophenol	1	-	1.20E+01	-	-	3.00E-02	-	-	0.272331155	418.4100418
Phenacetin	-	-	-	-	-	-	-	-	NA	NA
Phenol	1	-	-	-	-	6.00E-01	-	-	NA	8368.200837
Phorate	2	-	-	-	-	2.00E-04	-	-	NA	2.789400279
2-Picoline	-	-	-	-	-	-	-	-	NA	NA
Polychlorinated biphenyls	1	2.20E-04	7.70E+00	-	-	-	-	-	0.004244122	NA
Aroclor 1016	1	-	7.70E+00	-	-	-	-	-	0.004244122	0.976290098
Aroclor 1221	1	-	7.70E+00	-	-	7.00E-05	-	-	0.004244122	NA

APPENDIX 4

Page 7 of 11

TABLE 6-2 (continued)

Common Name	References	Oral Unit Risk I/(mg/L)	Oral Slope Factor I/(mg/kg-day)	Inhalation Unit Risk I/(µg/m³)	Inhalation Slope Factor I/(mg/kg-day)	Oral RD (mg/kg-day)	Inhalation RfC (mg/m³)	Inhalation RfD (mg/kg-day)	RBCc (mg/kg)	RBCnc (mg/kg)
Aroclor 1232	1		7 70E-00						0 004244122	NA
Aroclor 1242	1		7 70E-00						0 004244122	NA
Aroclor 1248	1		7 70E-00						0 004244122	NA
Aroclor 1254	1		7 70E-00						0 004244122	NA
Aroclor 1260	1		7 70E-00						0 004244122	NA
Propylamine	1					7 50E-02			NA	1046 025103
Propylene dichloride	1						4 00E-03	1 14E-03	NA	NA
Pyridine	1					1 00E-03			NA	13 94700139
Sarole	1								NA	NA
Selenium	1					5 00E-03			NA	51 70630817
Silver	1					5 00E-03			NA	10 5999576
1,2,4,5-Tetrachlorobenzene	1					3 00E-04			NA	4 184100418
1,1,2-Tetrachloroethane	1	7 40E-07	2 60E-02	7 40E-06	2 59E-02	3 00E-02			1 256913022	418 4100418
1,1,2,2-Tetrachloroethane	1	5 80E-06	2 00E-01	5 80E-05	2 01E-01				0 163398693	NA
Tetrachloroethene	1					1 0E-02			NA	139 4700139
2,3,4,6-Tetrachlorophenol	1					3 00E-02			NA	418 4100418
Tetraethylthiopyrophosphate	1					5 00E-04			NA	6 97350697
Tetraethylpyrophosphate	1								NA	NA
Thallium oxide	1								NA	NA
Thallium acetate	1					9 00E-05			NA	1 188903567
Thallium carbonate	1					8 00E-05			NA	1 05680317
Thallium chloride	1					8 00E-05			NA	1 05680317
Thallium nitrate	1					9 00E-05			NA	1 188903567
Thallium selenite	1								NA	NA
Thallium (I) sulfate	1					8 00E-05			NA	1 05680317
Toluene	1					2 00E-01	4 00E-01	1 14E-01	NA	2789 400279
o-Toluidine	1								NA	NA
p-Toluidine	2	5 40E-06	1 90E-01						0 171998624	NA
Toxaphene	1	3 20E-05	1 10E-00	3 20E-04	1 12E+00				0 029708853	NA
1,2,4-Trichlorobenzene	1,2					1 00E-02	9 0E-03	2 6E-03	NA	139 4700139
1,1,2-Trichloroethane	1	1 60E-06	5 70E-01	1 60E-05	5 59E-02	4 00E-03			0 057332875	55 7800558
Trichloroethene	1								NA	NA
Trichlorofluoromethane	1					3 00E-01			NA	4184 100418
2,4,5-Trichlorophenol	1					1 00E-01			NA	1394 700139

94-DMP-001741

94-DMR-001741

APPENDIX 4

Page 8 of 11

TABLE 6-2 (continued)

Common Name	References	Oral Unit Risk 1/(mg/L)	Oral Slope Factor 1/(mg/kg-day)	Inhalation Unit Risk 1/(ug m ³)	Inhalation Slope Factor 1/(mg/kg-day)	Oral RfD (mg/kg-day)	Inhalation RfC (mg/m ³)	Inhalation RID (mg/kg-day)	RfC _c (mg/kg)	RfC _{nc} (mg/kg)
2,4,6-Trichlorophenol	1	3.10E-07	1.10E-01	3.10E-06	1.08E-01	6.0E-03			0.297088532	NA
1,2,3-Trichloropropane	1	-							NA	33.68200837
0,0-Dimethyl phosphorothioate									NA	NA
2,4,5-Trichlorophenoxyacetic acid	1	-				8.00E-03			NA	111.5760112
2,4,5-Trichlorophenoxypropionic acid	1					5.00E-05			NA	0.69735007
1,3,5-Trinitrobenzene	2					2.00E-00			NA	2.7894.00279
m-Xylene	2					2.00E-00			NA	2.7894.00279
p-Xylene	2								NA	NA
Total Xylene (mixed isomers)	1					2.00E-00			NA	2.7894.00279
Vinyl chloride	2	5.40E-05	1.90E-00	8.40E-05	3.00E-01				0.017199862	NA

1 IRIS April 7, 1994

2 HEAST FY 1993 Annual and Supplement 1

3 EPA 1993

APPENDIX 4

Page 9 of 11

TABLE 6-3

IDM CONSTITUENTS OF CONCERN
CARCINOGENS AND NONCARCINOGENS RISK-BASED CONCENTRATIONS FOR SOIL

Common Name	CAS No	References	Oral Unit Risk 1/(mg/L)	Oral Slope Factor 1/(mg/kg-day)	Inhalation Unit Risk 1/(µg/m³)	Inhalation Slope Factor 1/(mg/kg day)	Oral RfD (mg/kg day)	Inhalation RfC (mg/m³)	Inhalation RfD (mg/kg day)	RBCc (mg/kg)	RBCnc (mg/kg)
2 Hexanone	591 78-6									NA	NA
2 Methylinaphthalene	91 57-6									NA	NA
2 Nitroaniline	88 74-4	2						2 00E 04	5 70E 04	NA	NA
2 Nitrophenol	88 75 5									NA	NA
3 Nitroaniline	99-09 2									NA	NA
4 Chlorophenyl phenyl ether	7005-72-3									NA	NA
Acenaphthene	83 32 9	1								NA	NA
Acenaphthylene	208 96 8						6 00E-02			NA	NA
alpha BHC	319 84-6	1		6 30E+00	1 80E-03	6 29E+00				NA	836 8200837
Aluminum	7429 90-5									NA	NA
Ammonia	7664-41 7	1						1 00E-01	2 86E-02	NA	NA
Anthracene	120-12 7	1					3 00E-01			NA	297916666 7
Azaphosmethyl	86 50-0									NA	NA
Benzo(ghi)perylene	191-24-2									NA	NA
Benzene acid	65 85-0	1					4 00E+00			NA	55788 00558
Benzyl alcohol	100-51 6	2					3 00E 01			NA	4184 100418
beta BHC	319 85 7	1		1 80E+00	5 30E-04	1 83E+00				0 0181554	NA
Bolitar	33400-43 2									NA	NA
Carbazole	86-74-8	2		2 00E 02				1 6339869		NA	NA
Cesium	7440-46-2									NA	NA
Chlorpyrifos	2921-48 2	1					3 00E 03			NA	41 84100418
Cobalt	7440-48-4									NA	NA
Copper	7440-50-8									NA	NA
Coumaphos	56-72-4									NA	NA
2 4 DDD	53 19-0	1		2 4E 01						NA	NA
2 4 DDE	3424-86-6	1		3 4E-01						0 1361656	NA
o p DDT	789-02-6	1		3 4E-01	9 7E-05	3 4E-01	5 0E 04			0 0961169	NA
delta BHC	319-86-8									0 0961169	6 973500697
Demeton	8065-48 3	1					4 00E-05			NA	NA
Diazinon	333-41 5									NA	0 557880056
Dibenzofuran	132-64 9									NA	NA
Dichlorvos	62-73 7	1		2 90E 01			5 00E-04			0 1126888	6 973500697
Endosulfan II	33213-65 9	2					6 0E 03			NA	83 68200817
Endosulfan sulfate	1031 07-8	2					6 0E 03			NA	83 68200837

Page 10 of 11

Common Name	CAS No	References	Oral Unit Risk 1/(mg/L)	Oral Slope Factor 1/(mg/kg day)	Inhalation Unit Risk 1/(µg/m³)	Inhalation Slope Factor 1/(mg/kg day)	Inhalation Oral RfD (mg/kg-day)	Inhalation RfC (mg/m³)	RfD (mg/kg day)	RBCc (mg/kg)	RBCnc (mg/kg)
ENP	2104-64-5	1	-	-	-	-	1 00E-05	1 00E+00	NA	NA	0 139470014
Ethion	563 12 2	1	-	-	-	-	5 00E-04	-	NA	NA	6 973500697
Ethioprop	13194-48-4	-	-	-	-	-	-	-	NA	NA	NA
Ethylbenzene	100-41-4	1	-	-	-	-	1 00E-01	1 00E+00	NA	NA	1394 700139
Fensulfobion	115 90 2	-	-	-	-	-	-	-	NA	NA	NA
Fenthion	55 38 9	-	-	-	-	-	-	-	NA	NA	NA
Fluorene	86 73 7	1	-	-	-	-	-	-	NA	NA	NA
Isochlorone	78 59 1	1	-	9 50E-04	-	-	4 00E-02	-	NA	NA	557 8800558
Lithium	7439 96-5	-	-	-	-	-	2 00E-01	-	NA	NA	34 399725
Malathion	121 75 5	1	-	-	-	-	2 00E-02	-	NA	NA	NA
Manganese	7439 96 5	1	-	-	-	-	1 40E-01	5 00E-05	NA	NA	278 9400279
Merphos	150-50-5	1	-	-	-	-	3 00E-05	-	NA	NA	NA
Mevinophos	7786-34 7	-	-	-	-	-	-	-	NA	NA	0 418410042
Molybdenum	7439 98 7	1	-	-	-	-	5 00E-03	-	NA	NA	15 54243084
Monocrotophos	6923-22-4	-	-	-	-	-	-	-	NA	NA	NA
N Nitrosodiphenylamine	86 30 6	1	-	4 90E-03	-	-	-	-	NA	NA	NA
Naled	300 76 5	1	-	-	-	-	-	-	NA	NA	6 6693344
Nitrate	14797 55 8	1	-	-	-	-	2 00E-03	-	NA	NA	27 89400279
Nitrite	-	1	-	-	-	-	1 60E+00	-	NA	NA	22315 20223
Orthophosphate	14265-44 2	-	-	-	-	-	1 00E-01	-	NA	NA	1394 700139
p-Phenylenediamine	106-50-3	2	-	-	-	-	1 90E-01	-	NA	NA	2649 930265
Phenanthrene	85-01 8	-	-	-	-	-	3 00E-02	-	NA	NA	NA
Pyrene	129-00-0	1	-	-	-	-	-	-	NA	NA	418 4100418
4 Nitro 1-oxide-quinoline	56-57 5	-	-	-	-	-	-	-	NA	NA	NA
Ronnel	299 84 3	-	-	-	-	-	-	-	NA	NA	NA
Sutrophos	22248 79 9	-	-	-	-	-	-	-	NA	NA	NA
Srornium	7440-24-6	1	-	-	-	-	6 00E-01	-	NA	NA	233 3087063
Styrene	100-42 5	1	-	-	-	-	2 00E-01	1 00E+00	NA	NA	2789 400279
Sulfate	14808 79 8	-	-	-	-	-	-	-	NA	NA	NA
Sulfide	18496-2508	-	-	-	-	-	-	-	NA	NA	NA
Tin	7440-31 5	2	-	-	-	-	6 00E-01	-	NA	NA	NA
Toxothion	34643-46-4	-	-	-	-	-	-	-	NA	NA	5899 705015
Tributyl phosphate	126-73 8	-	-	-	-	-	-	-	NA	NA	NA
Trichloronate	327 98-0	-	-	-	-	-	-	-	NA	NA	NA

94-DML-001741

APPENDIX 4

Page 11 of 11

TABLE 6-3 (continued)

Common Name	CAS No	References	Oral Unit Risk 1/(mg/L)	Oral Slope Factor 1/(mg/kg day)	Inhalation Unit Risk 1/(µg/m³)	Inhalation Slope Factor 1/(mg/kg-day)	Oral RfD (mg/kg day)	Inhalation RfC (mg/m³)	Inhalation RfD (mg/kg day)	RBCc (mg/kg)	RBCnc (mg/kg)
Vanadium	7440-62-2									NA	NA
Vinyl acetate	108-05-4									NA	NA
Zinc	7440-66-6	1					3.00E-01			NA	190.8761214

1 IRIS 1994

2 III AST FY 1993 and Supplement 1

DISPOSITION OF SOIL AND
SEDIMENT INVESTIGATION-
DERIVED MATERIALS

5/12/94

4-H46-ENV-OPS-FO 29
REVISION 0
PAGE 61 OF 67

APPENDIX 5

Page 1 of 1

FORM FO 29E, COMPUTER-GENERATED CLASSIFICATION OF IDM

U.S. DEPARTMENT OF ENERGY ROCKY FLATS PLANT

FORM FO.29E

COMPUTER-GENERATED CLASSIFICATION OF IDM

Page 1 of

Rocky Flats Project _____ Drilling location number or OU _____
Date Determination Performed _____
Drum No _____
Associated _____
Sample _____
Numbers _____

(1) Analyte Name	(2) Average Concentration (mg/Kg) Avg	(3) Analyte above Mean + 2SD? (Yes/No)	(4) Constituent Concentration >AF X TC (Yes/No)	(5) IDM RCRA Constituent of Concern? (Yes/No)	(6) RCRA Risk Analysis Carcinogenic Ratio (Avg X IF X SI)	(7) RCRA Risk Analysis Noncarcino- genic Ratio (Avg X IF/RFD)	(8) Inclusive Risk Analysis Noncarcinogenic Ratio	(9) Inclusive Risk Analysis Noncarcinogenic Ratio
					RCRA Cumulative Risk			
					Inclusive Cumulative Risk			

SAMPLE

Drum Disposition _____

Comments _____

ERPD Risk Analyst _____ Signature _____ Date _____ ERM PM _____ Signature _____ Date _____

The analytical information described on this form is based on information from potentially unvalidated data from RFEDS. This form has been completed in accordance with 4-H46-ENV-OPS-FO 29. A subcontractor was used in support of completing this form and the work has not been independently verified by the PM. Based on the above this form is accurate to the best of the PM's knowledge and belief.

94-DMR-001741

APPENDIX 6

Page 1 of 6

RISK-ANALYSIS METHOD

The risk-analysis method used in this procedure will be applied for IDM RCRA Constituents of Concern (RCRA risk analysis) and for all other IDM Constituents of Concern (inclusive risk analysis). In the risk analyses, constituent concentrations in the IDM are compared to chemical-specific Risk-Based Concentrations (RBCs) for soil. The calculation of RBCs is based on multiple exposure pathways (direct ingestion of soil, dermal absorption, inhalation of suspended soil, and ingestion of food grown in contaminated soil), EPA chemical toxicity data, and conservative target risk levels (excess cancer risk of 10^{-6} and HQ of 1 for noncarcinogenic effects).

The RCRA risk analysis will be performed as follows for all IDM RCRA Constituents of Concern:

Carcinogens Ratios of constituent concentrations to RBCs will be calculated and then summed. If the sum is greater than 1 (representing a cumulative cancer risk of 10^{-6}), the IDM will be managed as a RCRA waste.

Noncarcinogens Ratios of constituent concentrations to RBCs will be calculated and then summed. If the sum exceeds 1 [cumulative Hazard Index (HI) of 1], the IDM will be managed as a RCRA waste.

The inclusive risk analysis will be performed as follows for all IDM Constituents of Concern:

Carcinogens Ratios of constituent concentrations to RBCs will be calculated and then summed. If the sum is greater than 1 (representing a cumulative cancer risk of 10^{-6}), the IDM will be held in non-RCRA interim storage. If the sum of ratios is 1 or below, the IDM may be removed from storage.

Noncarcinogens Ratios of constituent concentrations to RBCs will be calculated and then summed. If the sum exceeds 1 (cumulative HI of 1), then the IDM will be held in non-RCRA interim storage. If the sum is 1 or below, the IDM may be removed from storage.

94-DMR-001741

APPENDIX 6

Page 2 of 6

The equations, default exposure parameters, and other factors used in deriving the RBCs are described below

Basic Equations for Calculating RBCs for Soil:

The generic equations used to calculate multiple-pathway RBCs for soil are shown below. The equations are derived using the Environmental Protection Agency (EPA) guidance for risk assessment in accordance with EPA, Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual, 1989 and the Colorado Department of Health (CDH) Interim Final Policy and Guidance on Risk Assessments for Corrective Action at RCRA Facilities, November 1993. The CDH guidance was specifically used to obtain the intake parameters in the following equations. RBCs are chemical specific, and are in Appendix 6, Tables 6-2 and 6-3.

Chemical-specific toxicity factors, namely reference doses (RfDs) for noncarcinogenic effects and slope factors (SFs) for carcinogenic effects, are used in calculating the RBCs. These toxicity factors are developed by EPA, and undergo periodic review and revision. In addition, new toxicity factors may become available as additional chemicals are evaluated. The primary source of EPA toxicity factors is the IRIS, an on-line database of EPA-verified toxicity values. The second source for toxicity factors is HEAST for the current year. Additional toxicity information for some chemicals may be available from the EPA Environmental Criteria and Assessment Office (ECAO). The tables containing the toxicity factors will be updated on a periodic basis by the Environmental Restoration Risk Management Group.

Intake factors (IFs) used in the RBC equations shown below are described in detail in this appendix. IFs for noncarcinogenic effects and carcinogenic effects are calculated using slightly different equations. All IFs used in the calculation of RBCs have units of kg soil/kg body-weight per day (kg/kg-day). RfDs have units of mg chemical/kg body weight per day (mg/kg-day). SFs have units of risk per mg/kg-day.

94-DM2-001741

APPENDIX 6

Page 3 of 6

Noncarcinogenic Effects

$$RBCnc = \frac{HQ}{\frac{IFo + IFd + IFf}{RfDo} + \frac{IFi}{RfDi}}$$

where RBCnc = Risk-based concentration for noncarcinogenic effects of chemicals in soil (chemical specific) (mg chemical/kg soil)
 HQ = HQ for noncarcinogenic effects = 1
 IFo = Oral intake factor for soil ingestion (kg/kg-day)
 IFd = Dermal intake factor for dermal absorption from soil (kg/kg-day)
 IFf = Oral intake factor for ingestion of homegrown produce (kg/kg-day)
 IFi = Inhalation intake factor for inhalation of suspended soil (kg/kg-day)
 RfDo = Oral reference dose (chemical specific) (mg/kg-day)
 RfDi = Inhalation reference dose (chemical specific) (mg/kg-day)

Carcinogenic Effects

$$RBCc = \frac{10^{-6}}{(IFo + IFd + IFf) \times SFo + IFi \times SFi}$$

where RBCc = Risk-based concentration for carcinogenic effects of chemicals in soil (chemical specific) (mg/kg)
 10⁻⁶ = Target cancer risk level (1 in 1,000,000)
 IFo,d,f,i = Same as previous equation
 SFo = Oral cancer slope factor (chemical specific) (1/[mg/kg-day])
 SFi = Inhalation cancer slope factor (chemical specific) (1/[mg/kg-day])

The equations are generic since all pathways do not apply to all chemicals, and toxicity factors are not available for all chemicals. Specific pathways that are not addressed for some chemicals include inhalation of volatile organics as particulate matter, uptake of non-metals by food grown in soil, and dermal absorption of polycyclic aromatic hydrocarbons. Volatile organics evaporate from airborne soil particles, and therefore, will not be inhaled as particulate matter. In addition, only metals are primarily taken up by food plants. In cases where toxicity factors do not exist for a given pathway, that pathway will not be included in the RBC calculation.

94-DMR-001741

APPENDIX 6

Page 4 of 6

Intake Factors and Exposure Parameters:

The calculation of IFs for soil ingestion, dermal absorption, inhalation of particulates, and ingestion of food grown in soil are shown below. The exposure assumptions are based on CDH default values (CDH 1993).

Ingestion of Soil (Time-weighted average)

$$IF = \frac{(IR_{child})(ED_{child})}{(BW_{child})} + \frac{(IR_{adult})(ED_{adult})}{(BW_{adult})} \times \frac{(CF)(EF)}{(AT)}$$

where IF	=	Intake factor = 1.6E-06 kg/kg-day (carcinogens) = 3.7E-06 kg/kg-day (noncarcinogens)
IR _{child}	=	Ingestion rate for child ages 1-6 = 200 mg/day
IR _{adult}	=	Ingestion rate for ages 7 and up = 100 mg/day
ED _{child}	=	Exposure duration for child 1-6 = 6 yr
ED _{adult}	=	Exposure duration for adult = 24 yr
BW _{child}	=	Body weight for child 1-6 = 15 kg
BW _{adult}	=	Body weight for adult = 70 kg
CF	=	Conversion factor = 1E-06 kg/mg
EF	=	Exposure frequency = 350 days/yr
AT	=	Averaging time = 25,550 days (70 yr) (carcinogens) = 10,950 days (30 yr) (noncarcinogens)

94-DMR-001741

APPENDIX 6

Page 5 of 6

Dermal Absorption from Soil (Time-Weighted Average)

$$IF = \left[\frac{(SA_{child})(ED_{child})}{(BW_{child})} + \frac{(SA_{adult})(ED_{adult})}{(BW_{adult})} \right] \frac{(AB)(AF)(EF)(CF)}{(AT)}$$

where IF = Intake Factor = 2.9E-05 kg/kg-day (carcinogens)
= 6.8E-05 kg/kg-day (noncarcinogens)

SA_{child} = Exposed skin surface area for child ages 1-6 = 4,600 cm²

SA_{adult} = Exposed skin surface area for ages 7 and up = 7,100 cm²

ED_{child} = Exposure duration for child ages 1-6 = 6 years

ED_{adult} = Exposure duration for ages 7 and up = 24 years

BW_{child} = Body weight for child ages 1-6 = 15 kg

BW_{adult} = Body weight for adult = 70 kg

AB = Absorption factor = 0.5 (unitless)

AF = Adherence factor = 1.0 mg/cm²/event

EF = Exposure frequency = 350 events/year

CF = Conversion factor = 1E-06 kg/mg

AT = Averaging time = 25,550 days (70 years) (carcinogens)
= 10,950 days (30 years) (noncarcinogens)

EPA (EPA 1989) guidance states that it is inappropriate to use oral slope factors as a measure of dermal absorption for carcinogenic polycyclic aromatic hydrocarbons (PAHs). Therefore, dermal absorption of PAHs is not included in calculating RBCs for PAHs.

94-DNR-001741

APPENDIX 6

Page 6 of 6

Inhalation of Soil Particulates (Time-weighted Average)

$$IF = \left[\frac{(IR_{child})(ED_{child})}{(BW_{child})} + \frac{(IR_{adult})(ED_{adult})}{(BW_{adult})} \right] \frac{(CF)(ET)(EF)}{(PEF)(AT)}$$

where IF = Intake factor = 4 1E-11 kg/kg-day (carcinogens)
= 9 6E-11 kg/kg-day (noncarcinogens)

IR_{child} = Inhalation rate for child ages 1-6 = 0.73 m³/hour
IR_{adult} = Inhalation rate for ages 7 and up = 0.83 m³/hour
ED_{child} = Exposure duration for child ages 1-6 = 6 years
ED_{adult} = Exposure duration for ages 7 and up = 24 years
BW_{child} = Body weight for child ages 1-6 = 15 kg
BW_{adult} = Body weight for adult = 70 kg
CF = Conversion factor = 1E-06 kg/mg
ET = Exposure time = 24 hours/day
EF = Exposure frequency = 350 days/year
PEF = Particulate emission factor = 4630 m³/mg
AT = Averaging time = 25,550 days (70 years) (carcinogens)
= 10,950 days (30 years) (noncarcinogens)

Ingestion of Homegrown Fruits and Vegetables (Time-Weighted Average)

$$IF = \left[\frac{(ED_{child})}{(BW_{child})} + \frac{(ED_{adult})}{(BW_{adult})} \right] \frac{(IR)(FI)(EF)(CF)(TC)}{(AT)}$$

where IF = Intake factor = (TC)(4.5E-04) kg/kg-day (carcinogens)
= (TC)(1.0E-03) kg/kg-day (noncarcinogens)
ED_{child} = Exposure duration for child ages 1-6 = 6 years
ED_{adult} = Exposure duration for ages 7 and up = 24 years
BW_{child} = Body weight for child ages 1-6 = 15 kg
BW_{adult} = Body weight for adult = 70 kg
IR = Ingestion rate = 122,000 mg/day
FI = Fraction ingestion from a contaminated source = 0.36
EF = Exposure frequency = 350 days/year
CF = Conversion factor = 1E-06 kg/mg
TC = Chemical-specific soil to plant transfer coefficient
AT = Averaging time = 25,550 days (70 years) (carcinogens)